COAL AGE

Volume 14

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New York, December 5, 1918

Number 23

The Invincibles

Written expressly for Coal Age
By RUFUS T. STROHM

NOT all the brave are the men who died
On the hallowed soil of France
To stem the flood and to turn the tide
Of the gray-clad Hun's advance;
For here at home there are hosts of men
Of a loyal, sturdy mold,
Whose splendid deeds neither tongue nor pen
In a fitting way has told.

THEY are the men who remained to fight
By the working face and rib,
And cleaved through the solid anthracite
With the aid of fuse and squib;
For when the war in its lengthened course
Brought an increase of demands,
They bent their backs and they put new force
In the labor of their hands.

THEY heard no sound and they had no sight
Of the battle's raging hell,
And yet they shared in the grilling fight,
And they did their duty well;
But though the race of the boche is run
And the nations talk of peace,
The task of the miner is not done,
For the country's needs increase.

THE winter comes in the waning year
With an icy, numbing breath,
And millions quake with a growing fear
Of disease and cold and death;
But while the threat of impending woes
Makes their bravest spirits quail,
They lift their hands and their eyes to those
Who have not been known to fail.

Y^E men of brawn and of sympathy,
Who have heard their urgent cries-

Y^E miners, what will your answer be To the pleading in their eyes?

Underground Mining with Electric Shovels

By E. J. WITTHOFF Cleveland, Ohio.

SYNOPSIS — The ordinary well known steam shovel, reduced in size and driven by electrical energy, is growing in favor with mining men. This type of machine has been used for several years, particularly in iron mining. Cost records show a decided saving by their use.

LECTRIC shovels are becoming increasingly desirable and essential in underground mining. For years many of them have been used in underground iron, coal, zinc, limestone and salt mines. Their performance has definitely established them as highly productive, economical factors in this class of excavation.

The chart, Fig. 1, shows the power demand of one of these shovels in a New York iron mine. It is equipped with a 20-hp. motor and the record is of loading five consecutive cars of ore. For car No. 1 the average de-

main haulageway. They include, also, the expense of moving the shovel to different levels and locations. The ore was loaded into 3-ton gable bottom cars.

Under identical conditions and per-ton loading cost by hand-labor was 30c. and by shovel 16.6c. The saving per ton effected by the shovel was 13.4c. or \$5000 in nine months, which is equivalent to a 7 per cent. return on a \$100,000 investment.

A northwestern iron company has used a similar electric shovel for about $4\frac{1}{2}$ years. The ore was 25 per cent. fine, 75 per cent. lumps, the largest pieces being 2×2 ft. $\times 18$ in. This shovel loads 150 to 220 tons daily.

The following table gives the tonnage and the average cost per ton, for each fiscal year, ending June 30, from 1914 to May 1, 1918:

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Electric Shovel Tonnage Cost

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MY WWW WALLE	H.P.
MY WWW WAS NOW WITH	1.15
V	17.13
0 50 100 150 200 250 300 350 400 450 500 550 Seconds	600 650
Car No.3>VIdle>	Car No. 5
AVERAGE MORSEPOWER, 16.25	
AVERAGE HORSEPOWER A 14-25	POWER
A 11 / A 11 A 1 / 7.00 A 1/A 1/A 1/A	11/4

FIG. 1. DIAGRAM SHOWING POWER CONSUMPTION OF MINING SHOVEL LOADING FIVE CONSECUTIVE CARS OF IRON ORE

mand was 16.04 hp.; for car No. 2, 20.75 hp.; for car No. 3, 16.25 hp.; for car No. 4, 17 hp.; for car No. 5, 14.25 hp. This shows an average of 16.86 hp. for the total five cars.

Below is a detailed statement of the complete operating costs of this shovel for the last four months of 1917 and the first five months of 1918:

Month, 1917	Cars	Tons	Labor	Supp.	Power	Total Cost	Cost per Tor.
Sept	1,084	3,794	\$384	\$224.65	\$9.98	\$618.63	\$0.163
Oct	1,713	5,995	432	21.30		469.00	
Nov	378	1.042	204	122.86	3.24	330.10	. 317
Dec	1,148	2,296	384	11.54	10.10	405.64	. 177
1918							
Jan	1.064	2,128	400	56.05	9.70	465.75	. 219
Feb	1,396	3,290	524	131.27	13.20	668.47	. 203
Mar	1.756	5,268	800	241.80		1.058.80	
	2,095	6,285	832	177.41	18.90	1.028.31	. 164
Apr							
May	2,390	7,170	864	238.29	24.50	1,126.79	. 157
Total	13,024	37,268	\$4.824	\$1,225.17	\$122.32	\$6,171.49	
Avg	1.447	4,141	536	136.13	13.59	685.72	

These costs cover all the expense involved in actually loading the ore and tramming it about 300 ft. to the

Fig. 2 shows a Thew electric shovel, built by the Thew Automatic Shovel Co., of Lorain, Ohio, mining iron ore underground.

In a western zinc mine a mining shovel loaded 125 cars in $5\frac{3}{4}$ hours at a cost of less than 9c. per ton, including tramming. This represented a reduction in cost of handling material and hauling it to the shaft for hoisting from 16c. and 18c. per ton by hand to 9c. by the shovel, a direct saving of 45 to 50 per cent. Today five of these shovels are working in this mine.

The construction of an underground mining shovel is novel, not in the sense of being new and untried, but in being a somewhat radical variation from the standard full-circle swing type of steam shovel. This mining shovel is really an abridgement, a "pocket edition" of larger shovels, but with a pronounced difference in construction and working features to adapt it to advantageous and profitable use under the conditions pe-

culiar to underground operation. It possesses all the rugged strength and dependable digging ability of the bigger shovels in concentrated form. Its compactness does not, however, complicate its control, for it is easily operated by one man. A mine laborer of average intelligence can soon learn to handle it and produce good results.

Compacting the construction of the shovel—minimizing its over-all dimensions—was the basic step in its adaptation to underground mining. Besides the re-

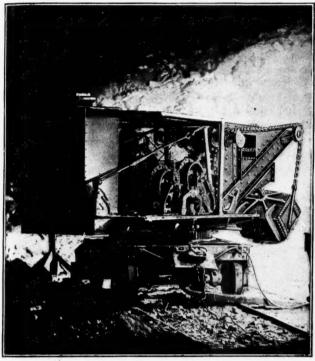


FIG. 2. SHOVEL USED IN UNDERGROUND MINING

stricted operating rooms, narrow entries and passageways had to be considered, as well as the shaft through which the shovel is taken into the mine. The shovel is so built that it can be quickly dismantled for passing through these restricted areas and speedily erected for succeeding operations. A remarkable instance of the "knocking-down" ability of these mining shovels is that a recent installation could be disassembled for taking through a 3 ft. 6 in. by 3 ft. 8 in. shaft.

Loading cars with facility and speed means keeping them moving. An excavator that requires the exact spotting of cars for receiving their load handicaps production seriously. Conditions often make it inadvisable, impossible, or too expensive to place track for locating cars in a certain, definite position. An underground mining shovel, rotating through a complete circle, has the advantage of being able to work in any direction; to load cars easily and quickly, either at the side of or behind the machine. The result is increased production and reduced overhead expense.

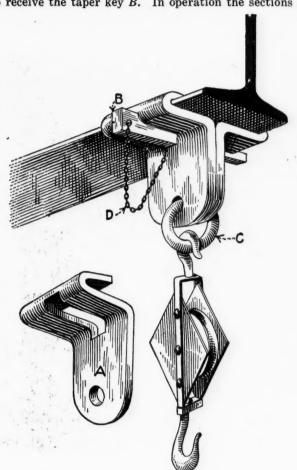
Experience has proved that electricity is the ideal power for these underground mining shovels. It is economical, safe and easily handled. Electricity need be used only while actually digging. Current can be switched on or off instantly. Electric power eliminates the dangers of explosions in coal mines caused by gases coming into contact with an open fire.

The motor is of the single, constant-speed type, with friction controls. All electrical equipment and connections are simple and may be readily understood by the operator. Hoisting, crowding, swinging and propelling movements are all controlled direct from this motor, in this manner minimizing physical effort on the part of the operator and enabling him to easily speed up tonnage delivery.

Every underground mining operation involving considerable output and affording sufficient working clearances can advantageously use one of these shovels. Their real worth is well summarized in the words of a mine superintendent: "The principal advantage is more production with fewer men, at less expense."

Quickly Detachable Clamp

A quickly removable clamp which can be used anywhere about the mine where I-beams are used is shown in the accompanying illustration. The clamp is made of two sections of machine steel, A, each being slotted to receive the taper key B. In operation the sections A



DETAILS OF EASILY DETACHABLE CLAMP

are clamped tight against the lower part of the beam by means of the wedge. The hanging ring is welded after passing through the lower holes of the sections. The holes should be large enough to allow free motion of the ring in order to permit setting and removing the hangers from the beam. For the sake of keeping all parts together, the key may be fastened to one of the sections by means of a small metal chain, such as is shown at D in the illustration.

Loading Out Coal with Electric Shovels

By W. B. BRENNAN Cheyenne, Wyo.

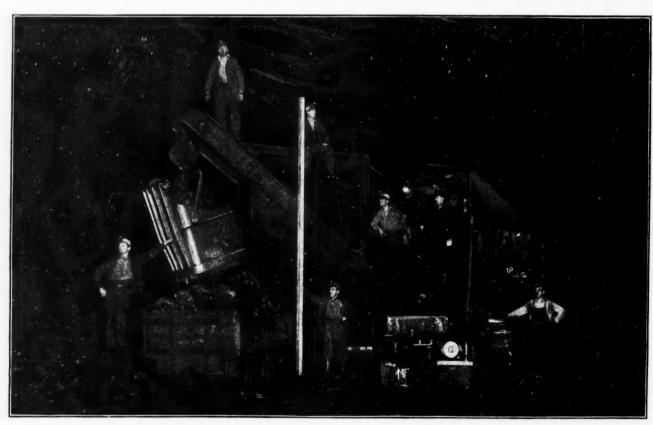
SYNOPSIS — Electric shovels have been used for several months in a coal bed 30 ft. thick that pitches 18 deg. Their use has proved financially profitable; and since the shovel is full revolving, delivery to pit car may be made at any of at least three points. Much of the transportation difficulty often encountered with so-called mechanical loaders is thus obviated.

N ORDER that a clear idea may be gained of the conditions under which shovel operation underground is conducted, it will be necessary to describe briefly the mining property and the coal bed. In mine No. 4 at Hanna, Wyo., where electric shovels are used in loading, the coal bed pitches 18 deg. and is nearly 30 ft.

the lower corner on the other near the floor. The bottoms are kept practically level and the entire room lies within the confines of the coal measure. Some coal is left in the roof as the shale above the coal bed will not stand.

When it was first attempted to operate with these shovels, it was the endeavor to cut, shoot down and load out daily. This did not prove satisfactory, however, as enough coal could not be secured from one undercut to keep the shovel operating throughout an entire shift. To overcome this, rooms were driven along the bottom with a height of 6 ft. into the face for a distance of 300, 400 and even up to 600 ft. When a room of this kind was made, the shovel moved in and 12 to 14 ft. of top was shot down. This gave the necessary coal to keep the shovel working.

This has proved fairly satisfactory, and at the pres-



SHOWING ELECTRIC SHOVEL IN SUCCESSFUL USE UNDERGROUND

thick. This mine is reached by a slope driven down the pitch, off which entries are turned on the strike. At 1000-ft. intervals along these entries panel planes or slopes are driven parallel with the main slope. From these panel planes rooms are driven, and it is in these that the shovels are employed. These rooms are approximately 28 ft. wide and 18 to 20 ft. high.

It will readily be perceived that a room of rectangular cross-section driven on the strike in such a coal bed will have the upper corner on one side near the roof and

ent time two shovels are working continuously; a third is about ready to be installed, and plans are on foot for a fourth one to be put in operation within the next six or seven months. These shovels are of the electrically driven full-revolving type. One is a 16-ton Type 00 Thew machine, while the other is a 32-ton Type 1 of the same make. In either case three men are required with a shovel, one man operating the machine, the other two part of the time working on the coal pile and part of the time trimming the mine cars or wagons as they

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without delay. The larger shovel loads from 175 to 225 tons daily and the smaller one from 140 to 180 tons.

It has always been my opinion that mechanical loading underground was quite as much a haulage problem as a loading one, if not even more so. Of the various types of mechanical loaders heretofore developed, practically all employ a conveyor which either discharges at a fixed point where it is necessary to place the pit cars or requires complicated machinery to handle the coal to various destinations. With a shovel which revolves it has been found that three different points exist where cars may be loaded without difficulty. This makes it possible to keep the shovel in operation continuously, there being no delay caused by waiting for cars to be

If a machine as expensive and complicated as a coal loader is to be made a commercial success, it is necessary to keep it in operation continuously during the entire working period of the mine. This is what it has been endeavored to accomplish with these shovels. This goal has been attained with considerable uniformity, there being not many more delays with these machines than occur with any machinery underground.

The first shovel has now been in operation since January, 1916, and the second since July, 1917. They are working daily and load about the average tonnage mentioned above. The most serious delay thus far encountered arises when it is necessary to move a machine from one loading place to another. This of course takes considerable time with a machine the weight of one of these Working places are, however, being so arranged that the various moves occur only four or five times per year per shovel.

The rate for loaders working after mining machines in the southern Wyoming field is 49c. per ton. These men lay their own tracks and timber rooms where necessary. Coal is undercut and shot by the company. It has been found in the use of these shovels that the actual cost of loading coal into the mine cars is only about 15c. per ton, but other expenses are involved, such as changing tracks, setting timber where necessary and a certain amount of switching which has to be done by the company men in connection with the shovels, such as is normally done by the loaders where they work under contract. Thus the cost of shovel loading averages 28 to 32c. per ton, which includes all labor, repairs on shovels, power and any other charges that can possibly be chargeable against mechanical loading. The effort has always been to make the charges against this method of loading as complete as possible.

In hauling to and from the shovel to the panel slope, mule haulage has in some cases been employed; but, where the rooms are long enough to justify it, locomotive haulage has been installed. This has proved quite satisfactory. The shovels are equipped with wide tractor wheels which travel on the bottom, and as the shovel moves forward the tracks are laid behind it.

As to the future of coal-loading machinery, it is my opinion that some type of loader built along the general lines of a shovel that will pick up the coal and be able to dispose of it in various places will be the successful mechanical loader of the future in mines giving 7 ft. or more of headroom. A loader of this type could be made to travel on mine tracks and should not weigh

are loaded, so as to get the maximum capacity on each much more than an arcwall or straight-face mining machine. A machine of this type with a properly designed boom and bucket could work in 7 ft. coal beds and load cars of a fair size to a reasonable capacity.

My experience with machinery in general underground is that it must be as simple and rugged as possible, since the class of labor obtainable is such that delicate and complicated machinery will not be found serviceable. Experience in this mine would indicate that the electric shovel meets the conditions admirably.

Testing a New Breathing Apparatus

By John Lyons Carterville, Ill.

In order to test the new Gibbs standard two-hour breathing apparatus a number of employees of the Madison Coal Corporation on Oct. 4 last journeyed by automobile to the Illinois state mine rescue station at Benton, Ill. The party was composed of William Turton, district superintendent; John Lyons, rescue foreman; Herschel Harriss, assistant mine foreman; John Lauder, face boss, and Fred Schoonover, safety inspector.

These men were well received by James Weir, superintendent in charge, who clearly described the different







METHOD OF ADJUSTING BREATHING APPARATUS

types of safety lamps and rescue apparatus kept at the station. The new Gibbs apparatus was explained and the machine thoroughly tested for leakages, careful note being made of the amount of oxygen contained in the cylinder at the start of the test and the amount used in a given time.

John Lyons was the first to wear the machine, the gage at this time showing 135 atmospheres. He performed work in the smoke gallery, such as pulling the 50-lb. weight, sawing props, crawling through the 17 x 19-in. tunnel, carrying a 130-lb. dummy single-handed round the gallery and then carrying the body end of a stretcher bearing a 160-lb. man with another man carrying the foot end. Lyons worked as fast as possible, not stopping at any time to rest. Unfortunately no record was kept of the actual work done. At the end of 30 min. the apparatus was taken off. The gage

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now read 75 atmospheres, showing that during the work-period of 30 min. 60 atmospheres of oxygen had been used, or almost one-half the capacity of the cylinder when fully charged. This amount equals 116 liters, or an average of 3.86 liters per minute for the 30 minutes.

Without recharging, Mr. Harriss at this point put on the apparatus, with the gage showing 75 atmospheres. A correct record was kept of the work performed by him, which was as follows: Trips around gallery (100 ft. per trip), 29; pulled 50-lb. weight 3 ft. high 90 times; pushed pit car a distance of 60 ft. 16 times; carried 130-lb. dummy single-handed 360 ft.; sawed props 4 in. in diameter with dull saw once; went through 17 x 19-in. tunnel once. The total time occupied during this work was 30 min., and the total amount of oxygen used was 40 atmospheres, or 77 liters, being an average of 2.56 liters per minute.

Mr. Schoonover then put on the apparatus without recharging, the gage reading 35 atmospheres. He walked round the gallery for 10 min. and was then forced out because he had no oxygen in the cylinder. The gage readings showed that he had used 35 atmospheres in 10 min., equal to 67 liters, or at the rate of 6.7 liters per minute. Undoubtedly there must have been something wrong with the gage, causing it to register more than the cylinders actually contained. No person under any condition, no matter how hard the work, is capable of using up so much oxygen. Experts consider that 3 liters per minute would be the maximum quantity used in hard work.

Special attention was given to the behavior of the automatic feed valve on the apparatus, which is said by the makers to allow sufficient oxygen to the wearer no matter at what speed he may be working and to reduce the quantity passing when the wearer ceases work or rests; also the temperature of the inhaled air from the breathing bag. The three wearers all agreed on the following opinions:

That at no time did they have to slacken their speed because the automatic valve was not delivering sufficient oxygen, enough being supplied at all times.

While the purifier got so hot that it could not be touched with bare hands, the temperature of the inspired air did not seem to rise perceptibly throughout the trials.

At no time did the breathing bag get so full as to make it uncomfortable to breathe against. This is brought about by the automatic release valve, which releases the air in the breathing bag when it reaches a certain pressure. However, it was thought that owing to this valve releasing easily it might have been the cause of using up such an excessive amount of oxygen during the period of 70 min. in which the apparatus was worn.

The center of weight of the apparatus is too high on the back, causing the person wearing it to have to lean forward in order to maintain his balance. A glance at the side view photograph accompanying this article illustrates this clearly.

It was also thought that the casing that covers the main part of the apparatus could be made a little lower. The present type comes too much in contact with the wearer's head when he bends down for such work as pulling the weight.

There should be some different arrangement for holding the gage when this is not being read. The wire clips now in use allow the gage to jump out when the wearer of the apparatus is using a saw or pulling the weight machine.

The foregoing trials were made with men well trained in the use and care of mine-rescue breathing apparatus. They are members of the rescue brigades which are maintained by the Madison Coal Corporation at its Carterville mines. These brigades have helped the state teams at explosions occurring in the southern Illinois coal field during the last four years, including the recent disaster at Royalton.

Coal Mine Proves a Sand Pit

Wheeler & Mason, coal operators of Columbus, Ohio, while opening a stripping operation on a tract of approximately 275 acres near New Lexington, Ohio, discovered a valuable deposit of molding sand. This is now being developed by the Perry Coal and Sand Co., chartered to produce and market the sand. Since Jan. 1 of this year the concern has marketed over 700 cars of the sand, which has proved highly successful in use.

Late in 1917 Mr. Wheeler started to clear the ground



REMOVING MOLDING SAND BY STEAM SHOVEL

by steam shovel preparatory to mining the 5-ft. bed of No. 6 coal which is on the property. After throwing a considerable amount of the sand aside, it was discovered that the overburden was probably more valuable than the coal deposit. Accordingly, an \$80,000 sand plant was erected and operations started as rapidly as possible. The deposit is 18 ft. thick and covers approximately 100 acres of the tract.

Under the sand is a 5-ft. stratum of shale which will be left for the present. Later on it is expected to remove the shale and market the coal beneath it.

Some of the most important equipment units requiring immediate attention following an explosion at a mine are as follows: Ventilating appliances, hoisting appliances, signaling appliances, brattice boards and canvas, props and ties, tools, nails and spikes, and miners' safety and portable electric lamps. An experienced man who has some qualifications as a leader should be detailed to look after each of the units mentioned and should be furnished such volunteer assistance as will constitute an efficient working force. Each of these foremen should then immediately proceed to perform the duties assigned him and organize his force into shifts of six or eight hours.—Rescue and Recovery Operations in Mines.

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Elimination of Power Losses*

BY GRAHAM BRIGHT East Pittsburgh, Penn.

SYNOPSIS—A shortage of power for industrial purposes has developed within the past few months. Various measures may be taken to alleviate this condition, some of which, such as changing the starting hour of the work day, might be considered as drastic. Electric operation of mines offers many possibilities of saving over either steam or compressed-air operation.

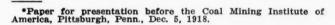
THE shortage of power supply in most of the central stations of the country, and the greater value of fuel, makes the economical use of power not only increasingly important but an actual necessity. The real economic use of power means not only the elimination of power losses, but the proper distribution of power in order to improve the load factor and permit of more customers being served or more apparatus being used with a limited amount of power-producing equipment. The large increase in industrial power consumption due to war conditions has loaded most power plants beyond their capacity, and a number of schemes have been devised to assist the central stations to take care of the abnormal conditions.

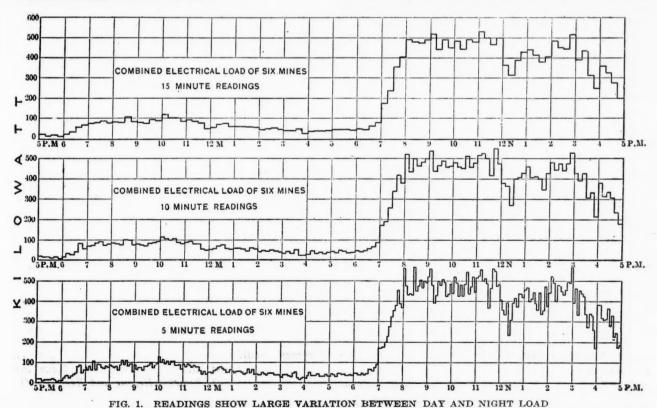
The first natural solution is to install additional capacity in the isolated plant or central station. There are, however, several objections to this. In the first place the financial condition of most mining companies and

central stations is such that even if they could obtain the consent of the Government, and could raise sufficient money to purchase additional equipment to make the necessary changes in power plant and transmission lines, the high cost of equipment, material and labor at the present time would scarcely justify the investment, especially when the conditions after the war are considered, at which time the industrial loads will probably decrease and the fixed charges on the new equipment will be much higher than under normal conditions.

A study of the load curve of a large central station will indicate to a considerable degree how the system can be relieved and how additional loads can be taken care of. The average central station load curve shows that the load from midnight until 6 a. m. is from 25 to 50 per cent. of the full load during the day. At 6 a. m. the load rises rapidly, reaching a maximum between 8 and 9 a. m. At noon the load suddenly drops off about half but rises rapidly again at 1 p. m. to about the same value as before noon. Between 3 and 4 o'clock in the afternoon the load starts to drop off, especially if there is much running load. If there is considerable railway and lighting load, there will be a rise again from 5 to 7 o'clock in the evening, after which the load will gradually decrease until midnight.

When a fair percentage of the load is mining, considerable assistance can be given the power station by shifting as much load as possible from the day to the night turn. Many mines are doing most of their pumping and cutting at night, which assists the load factor by decreasing the day load and increasing the night load.





This incidentally permits of more customers being served with a given amount of power station equipment. Some additional help can be given by changing the starting time and lunch hour of the day shift at some of the mines. In a few cases the rather drastic method of shutting off each customer in rotation for a short period two or three times a day has been necessary where the capacity is insufficient to take care of all the customers at the same time.

The curves shown in Fig. 1 were plotted from tests made simultaneously at six mines located in the same vicinity, the tests being made to determine the general shape of the load curve, the diversity of six mines compared to one, and the relative values of the 5-, 10- and 15-minute integrated peak loads, for a full day's run of 24 hours. These curves indicate the large variation between the day and night load and show that the load factor and capacity required could be considerably improved if some of the day load could be shifted to the time between 5 o'clock p. m. and 7 o'clock a. m. Incidentally the sum of the maximum peak loads of the individual mines shown in Fig. 1 was 50 per cent. greater than the combined peak.

There are two ways of helping out the power station irrespective of whether it is a central station or isolated plant. The first is to eliminate power losses wherever possible, and the second is to so schedule the use of power as to improve the load factor so as to require less capacity of power equipment.

POWER LOSSES IN ISOLATED PLANTS

In regard to the elimination of power losses, the mine with an isolated plant will be first considered. It is not always fair to compare the practice at a mine plant with the average central station because of the fact that the mine plant is generally located in an undesirable section far away from industrial centers, where living conditions are such that it is difficult to obtain and keep high-class labor. The average single mine cannot afford to employ experts continuously to keep the various parts of its power system in the best of condition. This places it at a disadvantage when compared to a mine using central station power.

Beginning with the boiler plant, considerable saving can be effected by employing an expert from time to time to go over the entire equipment carefully, and not only make recommendations regarding improvements and repairs, but carefully instruct the firemen regarding best methods of firing, cleaning fires, adjusting drafts, taking care of the ashes, etc. It is considered the best practice in a modern boiler plant to work the boilers at not less than 100 per cent. overload to give the best all-round efficiency. It is doubtful if there are many mine boiler plants where it is possible to work the boilers above rated load. This means that more boilers are in use than necessary and the individual boilers cannot be taken out of service long enough to give them the thorough cleaning and inspection they should have.

The water question is a most serious one in many mine boiler plants, and the proper treatment of boiler water requires an expert.

Some of the defects which should be watched for closely and where considerable saving can be effected if corrected, are as follows: Improper firing; defective settings; irregular inspection and cleaning; insufficient draft; no lagging on steam pipes and insufficient lagging on boilers (this is especially true in the South, where boilers are often mounted in the open without any sort of building protection whatever); leaky blow-off; leaky traps.

The engine room or other location using steam engines is a fertile field for the efficiency engineer. The fan engine is about the only engine around a mine on which the load is steady enough to permit of economical operation. Indicator cards often show that the engines are much underloaded and it is impossible to obtain high economy. The advantage of such an installation is that it will operate over long periods with little or no trouble. Considerable saving could be effected, however, by installing the proper size of engine or adopting motor drive.

In the engine room proper, where engines are used to drive generators, considerable saving in power can frequently be effected. The valve settings should be regularly checked by taking indicator cards, and no engine should be operated unless absolutely necessary. The load on a small or medium sized mine generator is extremely variable, so that high economy cannot be obtained. Fig. 2 illustrates a portion of a typical day

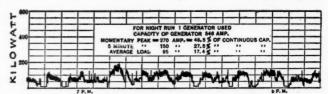


FIG. 2. DAY LOAD ON 1902-AMP. MINE PLANT

load on a plant having a capacity of about 1000 tons per day, and shows the wide variations in load that take place in a short period of time. The capacity of the generating equipment to meet a load of the character shown in Fig. 2 is based on the maximum peak instead of the average, and if the engine driving the generator is based on the average load it will be found that it will not have sufficient power to drive the generator at the maximum load.

The situation is often aggravated by the steam pressure being somewhat lower than the pressure for which the engine was designed. The result is as shown in Fig. 2, where it was found necessary to operate two generators during the day, having a combined capacity of 1092 amp., when, if sufficient driving power were available, one generator of less than half the total capacity would have been ample. Considerable saving in power could therefore be effected with the proper installation of engines and generators, but where possible a much greater saving could be effected by the installation of motor generator sets or rotary converters, using central station power.

Fig. 3 shows a typical section of the night load on the same plant. This curve shows that the generator and engine are operated over long periods at far below their normal capacity. This curve shows the advantage that would be obtained if a portion of the day load could be shifted to the night turn, permitting the generator to operate at nearer its full load capacity, thereby causing more efficient operation.

The real saving in power about the ordinary mine plant is shown by the adoption of central station current and the elimination entirely of all steam operation. If we compare the operation of the plant, portions of whose load curve are shown in Figs. 2 and 3, with one using central station power, we will find that the latter plant would require but a single 100-kw. rotary converter and, besides a considerable saving in power, the cost of operation would be much less.

In haulage a great amount of power is frequently wasted. A few mines use compressed-air locomotives, and this type of machine is inherently inefficient. One has simply to visit the compressor plant of a mine using compressed-air locomotives to realize that considerably more power is required than would be the case where an electric haulage system is installed.

I have in mind a particular installation near Pittsburgh where compressed-air locomotives were formerly used for the main haulage. The distance was about 10,000 ft., and in bringing a loaded trip from the inside it was necessary to stop six times to charge the air tanks. Since a large portion of the power required under such conditions is due to acceleration, one can readily imagine the extremely low efficiency of such a performance. The compressed-air locomotives on the main haulage have recently been replaced by electric machines, and a great saving both in power and labor has been effected.

LARGE TRANSMISSION LOSSES COSTLY

With an electric system of haulage, pumping, cutting and ventilation, there are often many opportunities to effect power saving. This can be accomplished by scheduling to an extent the use of power to improve the load factor and to improve the line and return circuit conditions so as to eliminate a large part of the transmission losses. Large transmission losses not only needlessly waste power but greatly shorten the life of the equipment, cause numerous delays and increase the cost of repairs.

These losses, when excessive, have a deleterious effect on the entire output of the mine. Much time is lost due to slow-speed operation, and the men will be idle a considerable portion of the time waiting for cars and because of delays arising from breakdowns and burnouts.

The electrical equipment is frequently blamed for troubles and delays where the real cause is in the transmission system. The remedy for low voltage does not always consist of the installation of additional copper. Frequently it will be found that the low voltage condition is due to poor splices in the overhead system or poor bonding in the return circuit. It is needless to say that all connections and splices in the overhead system should be carefully soldered and the bonding system frequently tested. Cross bonds should be installed about every 200 ft. and all switches, frogs and cross-overs should be carefully bonded around. Every mine should either have a bond-testing instrument or be able to borrow one periodically.

Where different trolley and feed wires run to adjacent localities in the mine, they should be frequently connected together in such a manner that the various circuits will help each other out. This will often be of great assistance, since the maximum load seldom occurs

in more than one circuit at the same time. The returns in power saving, decrease in delays, burnouts and repairs, together with the actual increase in output, will more than pay for the extra time and expense involved in improving the voltage conditions in the transmission system.

It is frequently found that considerable saving in power and capacity can be obtained by changing some of the maximum grades in a mine so as to take less power and permit the locomotive to handle greater trips.

Comparing the haulage system of mines to a street railway system, one seldom sees a broken-down car on the latter or hears of long delays due to defective equipment. This is largely due to two things—regular and systematic inspection and the use of spare equipment. The street railway companies and the large steel mills have found that rigid and regular inspection pays for itself many times over in the elimination of costly delays and breakdowns in service.

The actual cost of repairing a breakdown is frequently but a small proportion of the total cost, which arises chiefly from vexatious delays and loss of revenue and output. The proper inspection and upkeep of the equipment will therefore tend to keep the entire operation

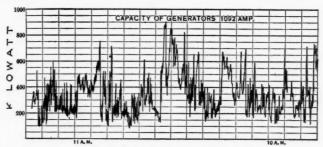


FIG. 3. EVENING LOAD ON 600-AMP. MINE PLANT

in logical working order and will eliminate a loss which is inevitable when part of a system breaks down and the remainder must operate, requiring normal power at a time when the output is greatly reduced.

Compressed air is sometimes used to operate steam pumps, in which case the efficiency is extremely low. The installation of a motor-driven pump would show a large saving in power. Considerable loss takes place in long air lines installed in mines. Air leaks do not have the property of "taking-up" like steam leaks, and are sometimes difficult to locate and repair. A leak in an electric circuit is soon detected and easily repaired, so that the loss in such a circuit will as a rule be much less than in a compressed-air line. It is not an uncommon sight to see a large steam-driven compressor operating over a long period when the only load on the air system consists of two or three small pumps, each of which could be operated by a 5-hp. electric motor. The load on the compressor in this case would probably be from 100 to 150 hp., largely due to the friction loss of the machine and the air leaks in the system.

The electric pump is without doubt the most efficient method of removing water from a mine. Where it is possible to do so, a further saving can be effected by arranging to do a large part of the pumping at night, in order to improve the load factor.

The ventilating system does not lend itself to changes which will improve the load factor. The fan must obviously operate at full speed during the day when there is the greatest demand for other power. There are many cases, however, where the speed of the fan at night can be reduced, thereby causing a large saving in power. Where a speed reduction of 2:1 is required, this can be readily obtained with the electric motor and the efficiency at one-half speed will not be far below the full load efficiency. This of course is not the case where a steam engine is used to drive the fan. The addition of booster fans will often accomplish certain results with much less expenditure of power than if the same results are obtained by speeding up the main fan.

As long as a piece of apparatus about a mine operates and causes no delay, its performance in regard to efficiency is seldom inquired into. A steam hoist is notoriously inefficient, due to the peculiar cycle of operation. Each cylinder must be capable of starting the heaviest load, which means that the combined engine is considerably larger than necessary. This permits of rapid acceleration and a short quick cycle is therefore possible.

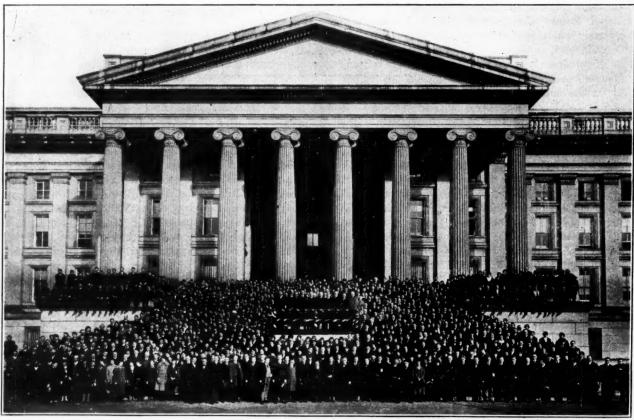
Indicator cards show that during the accelerating period the cards are practically square, after which drifting takes place until the braking period. The efficiency is naturally low and considerable power is saved by the use of electric hoists. With an electric motor uniform torque is obtained and an excess of capacity is not required. The efficiency depends somewhat on the electric system used, but in any case the efficiency is much higher and cost of operation is much lower than with the steam hoist.

This is clearly shown by some actual tests extending over a period of two years at one of the mines of the Lehigh Coal and Navigation Co. The results of the tests were published in a paper entitled "Economy of Electricity Over Steam for Power Purposes in and About Mines," by R. E. Hobart, mechanical superintendent of the Lehigh Coal and Navigation Co., at the February, 1918, meeting of the American Institute of Mining Engineers.

Cutting and punching machines may be of the compressed-air type, but a large proportion of these machines are electrically driven. Operating compressed-air cutting or punching machines at night is as a rule net economical, as it entails running large compressor units which may not be used for any other purpose at the time, resulting in inefficient operation. With the electric cutting machines, however, the power-producing apparatus can be operated economically at light loads and, as before stated, the principal saving effected by night operation is in the improvement of the load factor.

The methods to be employed for the elimination of power losses may be divided into two classes, one which will produce immediate results while the other, by reason of the equipment and changes involved, may require several months.

Under the first class may be mentioned: Regularity of inspection and repairs to power plant equipment; instructions to firemen, engineers and electricians; scheduling the use of power to improve the load factor; improving the transmission and return circuit conditions; changing time of starting day shift. Under the second class may be mentioned: Installation of new equipment; changing over to electric operation; changing over to central station power; providing spare equipment; providing spare parts for use when necessary.



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Preservative Treatment of Mine Timbers as a Conservation Measure*

BY KURT C. BARTH

Chicago, Ill.

SYNOPSIS - Wood preservative may be profitably applied to a large proportion of the lumber and timber used by mining companies. Three distinct methods of application are availablethe pressure, immersion and brush processesthe choice depending upon circumstances. Timbers treated with preservative and then coated with gunite should be nearly fireproof and of almost indefinite life.

OOD preservation applied to a large portion of mine construction is an important economy and a conservation measure of considerable magnitude. Preservative treatment of mine timber, for underground as well as surface structures, must be practiced systematically and consistently in accordance with established principles and in a manner which will assure the most practical results.

The object of preservative treatment is to increase the natural life of structural wood to equal the mechanical life, or to render it fit to serve the purpose intended for the full period of its mechanical usefulness. Thus, in every instance where decay may be expected to weaken and render the timber or structure unfit to perform the required service, necessitating repairs or replacement before its usefulness has ceased, the logical thing is to employ available means of counteracting such destructive influences-namely, to employ proved methods of retarding the development of fungous growths.

The fundamentals of wood preservation are definitely established. It only requires their application to the case in hand to ascertain whether the advantages to be derived from such practices warrant the expense of employing methods of preservative treatment, and exactly which methods or processes are most practical in the circumstances.

Consequently, the first step must be a careful analysis of the conditions directly or indirectly related to the matter, and their relative influence upon the determining factors. Practically, each mining property presents an individual problem, and particularly does this apply to coal mines. The suggestions contained herein must, therefore, be quite general, but their specific application requires merely suitable modifications to meet the conditions encountered.

Preservative treatment of timber is a conservation measure for several reasons: It permits the utilization of less durable species of wood for purposes where, if untreated, it would not be worth the labor of placing. (2) It prolongs the life of such timber until it equals and usually exceeds that of the most durable commercial species when used untreated. (3) It conserves

labor and releases for productive employment men engaged in the nonproductive capacity of replacing decayed timber. (4) It conserves the timber supply by reducing considerably the demand for repairs and replacements because of decay. (5) It increases the available supply of timber for other uses now possibly restricted because of the huge demands for mining pur-(6) By permitting the employment of timber obtainable in the immediate vicinity it lessens the demand upon transportation facilities for moving timber from distant sources of supply. (7) It conserves iron and steel products by the judicious substitution of wood for structural purposes, without sacrificing reasonable permanency.

These facts may not all apply in every case. As previously stated, they are general yet nevertheless of sufficient importance under present conditions, and in their relation to the period of reconstruction which is before us, to alone make imperative the adoption of wood preservation as a policy.

· ECONOMIC PHASES OF TIMBER TREATMENT

The economic phases of the matter are more pertinent, in that they permit visualization of the dollars and cents that may be saved. These may be enumerated as follows: (1) A saving of material, equal to the increased service obtainable from treated timber, and accessories used in construction. (2) Saving of the labor required for repairs, the handling of material, its manufacture, transportation, etc. (3) Saving of equipment and tools required for repairs or replacement of timber and structures. (4) Saving of time and the loss due to interrupted production necessitated by repairs which must be made where operations are continuous. (5) Saving in overhead and the expense of supervision and engineering often required for underground repairs or replacements. (6) A lower annual cost of treated underground timbering and wooden surface structures as compared with untreated wood, and a proportionate reduction of the cost of production per ton.

In any case where preservative treatments are at all advisable there will always be found a considerable net saving. It would be possible to present an interesting hypothetical case, but such figures would only be relative at best, and perhaps of little use for our present purpose, without a direct application to the particular

The practicability of preservative treatment is dependent upon a number of factors of varying values which must be carefully defined and translated into a simple mathematical problem of cost versus profit. These are primarily the following: (1) Species of wood to be employed, its physical fitness for the purpose and (2) Where local timber is to be employed, facilities for manufacturing, including peeling and seasoning. (3) Durability under prospective conditions of service. (4) Character of service in which timber and

^{*}Paper for presentation before meeting of the Coal Mining Institute of America at Pittsburgh, Penn., Dec. 5, 1918.

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lumber are to be employed, or the type of structure. (5) Average period of mechanical usefulness under existing and probable future conditions. (6) Average number of years additional service practically obtainable by the elimination of decay. (7) Cost of treatment required to obtain desired increase in life. (8) Annual cost of untreated timber or structure. (9) Annual cost of treated timber or structure. Such an analysis would answer the important question of whether treatment would pay.

The next step then would be to determine the most suitable method or process of treatment. Herein, as in most subjects, exist differences of opinion; but fundamentally there can be none, in that any treatment to be worth while must attain the desired object, which is to assure a sufficient saving to warrant its employment.

Under the stress of operating conditions methods must be devised and employed which often are far from the ideal, and when the most efficient is not available or too costly for the purpose, one less efficient but still sufficiently efficient to be worthy of consideration must be made to answer. To discard preservative treatment simply because, for instance, timber impregnated by the pressure process is not obtainable, or too costly, is illogical, since for just such conditions the non-pressure processes have been developed, and with proper safeguards are entitled to equal recognition.

PROCESSES OF PRESERVATIVE TREATMENT

The standard processes of treatment are divided into two groups. Group A—Pressure Processes—includes: (1) Full cell treatments; that is, impregnation of timber to a predetermined extent, leaving the wood cells full of preservative, applied in retorts or cylinders under artificial pressure, with (a) creosote oil, (b) zinc chloride, (c) solution of zinc chloride and creosote. (2) Empty cell treatments; that is, impregnation of timber to a predeterminated extent, in retorts or cylinders under high artificial pressure, and removal of the surplus preservative, leaving the wood cell walls coated and the cells more or less empty.

Group B—Non-pressure Processes—includes: (1) The open tank process; that is, the impregnation of timber in open tanks, or vats, under atmospheric pressure only, by complete submersion for varying periods in alternate hot and cold (or cooling) baths of refined coal-tar creosote oil. (2) Surface treatments; that is, several successive applications of refined coal-tar creosote oil to timber at points of contact, or over the entire surfaces by (a) brush treatments—two or more paint coats; (b) properly designed spraying machines; (c) dipping, or short immersions in the heated creosote.

A further grouping will divide all treatments into two classes: (1) Impregnation processes, including both pressure and non-pressure methods by which an adequate penetration of the preservative is obtained. (2) Surface treatments, the purpose of which is to retard decay at certain points exposed to a greater degree than are other portions.

Each method of treatment enumerated has definite limitations and advantages, and the selection of one must depend strictly upon meeting the requirements of the case in hand as may be dictated by an analysis of the governing conditions.

Sawed timbers which when in service are exposed to

severe mechanical wear must be impregnated with the preservative to an adequate depth in order to present an unbroken barrier to attack by fungous growths should abrasions and ordinary checks occur.

Round timbers, having an ordinary sap ring, when properly seasoned, can usually be satisfactorily treated by the open tank process, as the sap wood of practically all commercial species is readily impregnated.

Impregnation processes are always advisable when the maximum increase in the natural life of structural wood is desired, and in every instance where non-durable species of wood are employed. Timber surface structures in which durable grades are employed should be given at least a surface treatment at points of contact, either during construction or previously.

Structural wood should be seasoned air-dry before treatment, particularly when non-pressure processes are to be used. If green, artificial seasoning may be done in connection with pressure treatment, but seasoned timber is always preferable. For mining purposes, especially for underground uses, the timber must be peeled immediately after cutting, and then seasoned for at least 30 to 90 days, depending upon weather conditions and the season of the year.

The analysis previously outlined includes the selection of the preservative. This is, undoubtedly, by far the most important factor in determining the efficiency of any method of preservative treatment. Herein also there exists a great variety of opinions, in which numerous theories play a more or less important part. However, practical experience gained in the commercial practice of wood preservation during nearly four score years has clarified the situation to such an extent that we can today deal in definite values and the knowledge of actual performance. Primarily, we are concerned with two products—coal-tar creosote oil and zinc chloride.

Both of these preservatives have been in use sufficiently long to establish their relative merits beyond the possibility of detraction. Recently experiments with sodium fluoride for the treatment of underground timbers has given promising results, but the latter product has not yet established the reputation or record of other salts such as zinc chloride. For surface structures especially, and for by far the majority of all purposes, coal-tar creosote oil is eminently the most efficient preservative. There is no record of failure of properly creosoted timber.

Such minor points as appearance and odor have been much discussed, and until recently the wide-spread impression that the employment of creosoted timbers increases the fire hazard has been an obstacle to the general introduction of creosoting. But these objections have been overcome and removed by proper education and changes in methods. Those who have thoroughly investigated the matter realize that creosoted timber properly handled is not a fire hazard—on the contrary, dry creosoted wood is less inflammable than untreated wood.

Howard F. Weiss, in his book, "The Preservation of Structural Timber" (page 192), cites an experience where after a fire in a mine the untreated props were destroyed while the creosoted timber was merely slightly charred on the surface but still serviceable. Wood freshly impregnated is more inflammable than

before, but no matter for what purpose it may be intended, treated wood should always be thoroughly dry before placing.

Numerous mines have used creosoted timber for shaft lagging, shaft timbers, head frames, gangway and main entry sets, and so far I know of no record of fire or casualty directly or indirectly charged to the presence of creosote in the timber. It would seem therefore that much of the prejudice against creosoted wood for mine uses is really without foundation in fact, particularly where modern methods of fire prevention prevail.

Extensive experiments in fireproofing underground timbers in both coal and metal mines by mechanical application of concrete coatings has given considerable impetus to this method. It has occurred to me that a combination of creosoted timber and this "cementation process" would be an admirable type of permanent construction. It is practically impossible to absolutely exclude air and moisture by such a coating, consequently decay can be expected to progress unhindered, and possibly more rapidly, causing the weakening and collapse of the timber without the opportunity of detection in time to perhaps avoid accident.

UNTREATED TIMBERS FAIL RAPIDLY

Numerous instances have been observed where untreated electric power transmission poles set in concrete, nailing strips for floors partially embedded in concrete, as well as columns entirely encased in cement or plaster, have failed more rapidly than would otherwise have been the case. In consequence, when such type of construction is necessary the best practice requires preservative treatment, mostly surface applications of refined creosote of all parts partially or entirely inclosed. For instance, if the timber for shafts and permanent workings, or where the period of mechanical usefulness would warrant, were creosoted by the open tank process, which could be done at comparatively small expense at the mine, and when placed coated with 4 to ½ in. of cement and sand, decay would be practically eliminated; and the fire hazard, if existent, greatly reduced if not entirely removed.

This is merely a suggestion which I would be pleased to carry out in an experiment in coöperation with any mine operator interested. The theory is that by utilizing native round timber properly treated the necessary mechanical support is obtained, and that with an application of "gunite" merely sufficient to act as a fire retardant coating, the highest factors of safety and economy are combined.

Wood is still extensively employed for surface structures, and undoubtedly will be for some time to come, particularly now and during the immediate future, when steel and iron will be in such great demand as to necessitate its conservation wherever possible. In this field the employment of non-pressure processes is especially applicable. Repairs due to decay of timbers in exterior structures largely result from the development of fungi

in inclosed parts or at points of contact. Therefore, application of surface treatment to timbers previous to assembling will retard decay at the most vulnerable points and increase the life of the entire structure.

Many wooden tipples and shafthouses have been so treated, and after erection refined creosote found further employment as a substitute for paint because of its lower cost and greater preservative value. Such practice is not confined to mining operations, but is extensively used by other industries. Trestles of various types, which are of a semi-temporary nature, that is, the mechanical period of usefulness is set at 15 years or so—have been brush-treated or sprayed at points of contact in order to increase the natural life of the timber to equal the mechanical life desired. Telephone and electric poles are brush-treated with excellent results. Mills in which manufacturing processes create conditions favorable to the development of decay have installed tanks for treatment of lumber and timber for miscellaneous uses.

The development and promotion of non-pressure processes of treatment, which are entirely dependent upon the use of refined coal-tar creosote oil, have made it possible for the average consumers who cannot equip themselves with apparatus necessary to impregnate timber by the pressure processes, to enjoy the full benefits of wood preservation to the degree in which they conform to the simple but necessary requirements. It is now possible for every user of wood, large or small, to avoid the waste of permitting it to decay. Those who are not informed on the subject can readily become so through various sources. The United States Forest Service maintains a research department at the Forest Products Laboratory in Madison, Wis., which deals entirely with wood preservation problems and whose bulletins and reports are available to the public gratis. Manufacturers of preservatives employ experts to promote their proper use and to aid consumers in solving problems.

The coal industry has a very particular interest in the development and popularization of wood preservation because of the normally increasing consumption of coaltar creosote oil, largely a byproduct of coke making. Therefore, adoption of wood preservation is of twofold benefit in that it reduces considerably the high expense of timber replacement due to decay and furthers the expansion of an industry which consumes a large volume of one of the chief byproducts of coal.

Will Increase Coal-Loading Facilities at Hampton Roads

Eleven DeMayo bunkering machines are to be installed at Hampton Roads by the Port and Harbor Facilities Commission of the Shipping Board. Six additional coal barges with an aggregate capacity of 6500 tons are to be put in service. During the war, Hampton Roads has been the most important turn-around point on the Atlantic coast, with the exception of New York.

Five of the DeMayo machines have been constructed by the American Car and Foundry Co., of Berwick, Penn., and have been ordered to be shipped immediately. Three used machines were purchased in New York and are about to be shipped. Three more new machines have been ordered from a firm in New York.

These machines are capable of handling 75 tons of coal an hour, and it is intended to install two of them on each barge. The maximum capacity of the machines is rarely utilized, however, because it is impossible to trim the coal in the ship as rapidly as it can be turned into the bunkers. This trimming usually restricts the work of bunkering to between 25 and 50 tons an hour for each machine.

An Unusual "Bounce" Condition

BY A. C. WATTS

Salt Lake City, Utah

SYNOPSIS—"Bounces" occurred with annoying frequency in a heading driven in virgin territory and under comparatively light cover. This condition was somewhat mystifying until a fault was driven through and an analysis of conditions made. Beyond this fault, which is the second pierced by the development of this entry, no bounces have occurred.

URING the driving of a slope in one of the Utah mines of the Utah Fuel Co., considerable trouble was experienced from "bounces," the occurrence of which could not be explained by the commonly accepted theories which have heretofore satisfactorily accounted for such phenomena as had occurred in other parts of the same mine and in other mines of the same district. Heretofore bounces had taken place in pillar workings under heavy cover, but in this instance the workings were in virgin territory, several hundred feet away from room workings and 1500 ft. distant from the nearest pillar operations.

The first indication of trouble was the sloughing of the coal from the ribs of the entry, particularly the right rib facing down pitch. As the entry progressed the forces became greater and the coal from the ribs was broken up and thrown out with considerable force. As the entry was driven still further down the pitch, the roof coal would be broken down also and finally coal would be thrown from the face as far as 10 ft., extending the face as much as 5 ft. This face coal would be broken to pea size and smaller.

The width of the entry was widened in places to 16 ft. from an original width of 8 to 10 ft. To protect the entry and workmen, a concrete wall from 9 to 12 in. thick, reinforced with old rail, was built along the rib from which the coal sloughed most freely. This wall extended down the slope for 200 ft., and the rest of the entry was heavily timbered and lagged on ribs and roof. Finally work was abandoned temporarily in the main slope and an effort was made to advance the back slope ahead of it, in the hope that the pressure on the main slope would be relieved as the back slope had theretofore been comparatively quiet.

In driving the back slope the width was kept at 8 ft. and the height 6 ft., both sides and roof being heavily timbered and lagged. Although several bounces took place while driving the back slope, it was successfully driven down 150 ft. without accident until a fault was encountered. This fault, in connection with other conditions that will be described later, satisfactorily explained the cause of the bounces. The unexplainable feature is the entire absence of bounces in the level entries driven to right and left off the slope at the seat of trouble.

At the beginning of the explanation it must be stated that three conditions, which have proved conducive to bounces in this district, were present in this instance. They are (1) heavy cover, (2) the nature of the cover and (3) a hard, brittle coal. The cover here, as shown by the profile (Fig. 1), was 1500 ft. thick and was rapidly increasing as the slope came under the crest of a divide. This cover is made up to a large extent of massive sandstone, aggregating in some places 500 ft. thick. The sandstone is very cohesive and does not break and cave easily. The sloughing and bouncing of the ribs of the slope was aggravated by the butt cleavage of the coal, which ran nearly parallel with the direction of the slope and inclined 30 deg. off the vertical from the top of the seam. Ordinarily the butt cleavages in this district are not very pronounced, but bending action, which will be explained later, had made them at this point quite prominent.

So far conditions were ideal for bounces if the workings had been pillar workings, but other reasons had to

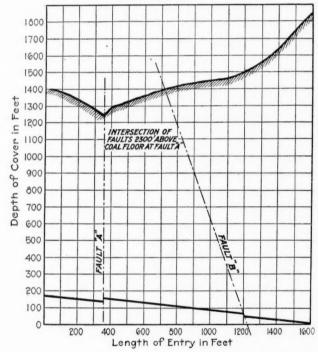


FIG. 1. PROFILE OF COAL BED AND SURFACE

be sought to explain why bounces should occur in an entry entering an apparently solid block of coal and territory never before worked. After the fault (fault B in Fig. 2) encountered in the back entry had been proved, it was found to be a downthrow of 17 ft., bringing the floor of a 5 ft. 3 in. upper seam to the same level as the 9 ft. 9 in. bed being worked. Further up the entry 840 ft. an up fault (fault A) of 18 ft. had been encountered. This fault (A) was practically perpendicular whereas the lower fault (B) inclined toward it 20 deg. Fault A crossed the slope at approximately 90 deg.; fault B at approximately 67 deg. The strata between these faults had been thrown off the normal pitch of the measures so that the normal pitch was increased in the fault block by 1 per cent.

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These two faults formed a wedge with the apex above the surface and thus left an unsupported block between them. Fault B, if continued to an intersection with the perpendicular fault A, would intersect it about 2300 ft. above the coal floor. The surface profile shows a marked depression directly over the extension of fault A, which depression undoubtedly marks this fault on the surface. The Government topographical map shows a canyon starting at this point.

As stated above, the frequency and force of the bounces increased as the entry was driven downward. The reason for this became apparent when the lower fault was struck and developed and a study made of the fault block in connection with the overlying strata. A geological section shows the two coal beds at this mine to be between heavy blocks of massive sandstone analogous to a brittle substance between two grindstones. The faulting forces had tilted the fault block out of conformity with the balance of the area, and probably there is still some tension at this particular section.

Furthermore, the inclination of the fault block tends to increase due to the pitch of the lower fault, which forms a slippage plane. This is further aggravated by the weight of the overlying strata, which are sheared by both faults clear to the surface and thus rest directly

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Section Looking Down Pitch (Showing Inclination of Butt Cleavages)

on the wedge-shaped fault block. Thus two forces are working on the comparatively soft and brittle coal. Naturally this pressure would relieve itself as soon as an opening was made in the coal. No bounces occurred in the back entry when driven below the fault, and it is not expected any will occur because solid ground is being entered; and the strata overlying the coal is better supported and not subject to stresses as found in the fault block.

It is interesting to speculate on the reasons for these faulting and bending actions. G. B. Richardson, in United States Geological Survey Bulletin No. 371, describes the structure of the Book Cliffs coalfield in which this mine is located as follows:

The strata of the Book Cliffs coalfield, forming as they do part of the southern margin of the Uinta synclinal basin, dip gently northward. The dip is not uniform, how-

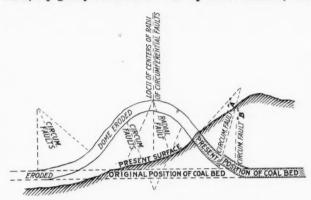


FIG. 3. ILLUSTRATING THE DOME THEORY OF FAULTS

ever, for this area, besides being included in the zone of folding of the Uinta Mountains and the Uinta Basin, is affected by the uplifts which produced the San Rafael Swell and the Uncompahgre Plateau. That part of the Book Cliffs coalfield which is included in the present report is gently warped, the eastern part constituting the end of a low, northward-plunging anticline, and the western part the end of a northward-plunging syncline. Conforming with this structure, the irregular S-shaped outline of the cliffs coincides with the strike of the rocks. There are, also, local faults of small displacement.

The district has also been described as the remnants of a great dome, the central portion of which has been eroded by the Price and San Rafael rivers by whose waters in ages past, geologists estimate, 160 billion tons of coal have been carried into the Gulf of California. Whichever it was, dome or a great warped syncline, the faulting action would be somewhat similar and each would explain the conditions that are found.

Accepting either the "drift" or "in situ" theory as correct for the formation of the coal, it was laid down in vast flat beds. At one part of these beds, which has since been covered with thousands of feet of sedimentary deposits, a vast dome had been lifted or a great warped fold had been made. This lifting action of the dome would develop two different lines of faulting: one radially from the center of the dome and the other circumferentially around the dome. There would be really two series of circumferential faults: one with the center of the dome for a center, and below the surface, and one centering toward or above the surface. These fault planes would form great, more or less, regular cylinders extending around the dome and with axes common with axis of the dome (see Fig. 3).

Evidences of the first series of circumferential faults are lacking due to erosion which has taken away the crest of the dome, but the latter series of circumferential faults, which mark the bend in the strata where they begin to resume their original flat position, is still in evidence and it was a combination of two of these faults that produced the condition so conducive to the bounces experienced.

Radial faults extending from the top center of the

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dome outward would gradually become less in magnitude of throw as the distance from the top of the dome increased. These faults would mark changes in the direction of the strike which are noticed in this district.

If the synclinal theory is accepted, we would find the faults which correspond to the circumferential faults of the dome theory extending in lines parallel with the axis of the syncline. Where there was a bend in this axis, or a warping, the faults would be thrown diagonal to the parallel direction and faults more or less perpen-

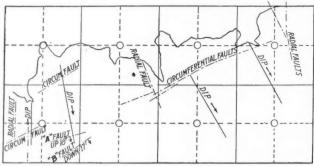


FIG. 4. GENERAL TREND OF FAULTS AND PITCH OF STRATA IN VICINITY

dicular to the axis would be possible. Fig. 4 plainly shows this theory to be plausible in the district. The strike of the strata has changed approximately 15 deg. and this was accomplished gradually without the appearance of radial faults sufficiently strong to give abrupt changes in strike and prove the dome theory. However, it must be said the structure of the coal deposits has not been thoroughly studied as a whole, and the various districts in which mining is being prosecuted have not been completely correlated. Also, that the district under discussion comprises only about three miles of a territory that embraces hundreds of square miles. It would thus not be safe to say that conditions which seem to prove one theory in this district prove it for the whole.

It is apparent that the two faults making an unsupported block so shaped that movements were invited, so to speak, were the main cause of the bounces. The change in the direction of the strike caused a bending stress in the strata which was not relieved by radial faults and only partially relieved by fault B. This bending stress is still potential and is manifested by the exaggeration of the butt cleavages and partially in the bounces.

Wireless Telegraphy

"It's all right to tell your wife some things, but one ought not to tell his wife everything."

This bit of philosophy fell from the lips of the president of one of the local unions of the United Mine Workers at a scale convention held in a large mining town recently. After stating this truth, the president of the union explained what was in his mind.

The financial secretary of the union at a certain mine had been given the password of the union, which is very sacred. The financial secretary told it to his wife after swearing her never to reveal it. (Is there any use of continuing?) The secretary's wife told the pit boss' wife and she——. The president reported the election of a new financial secretary.

Legal Department

EMPLOYEE INJURED WHILE RIDING ON CARS—The Alabama statute which forbids mine employees to ride on haulage trips in going to and from their places of work has no application to tramways outside of mines, disconnected with such ways in mines. Hence the statute did not apply to the case of a miner riding on a tram car used on the surface to carry coal from a stock pile to the point of loading on railway cars. (Alabama Supreme Court, Monte-Vallo Mining Co. vs. Underwood, 79 Southern Reporter, 453.)

COAL FREIGHT RATES—The North Dakota Supreme Court has denied the right of a railway company to recover the excess of claimed reasonable rates on intrastate shipments of coal above statutory rates against a shipping operator. This suit—Minneapolis, St. Paul & Sault Ste. Marie Railway Co. vs. Washburn Lignite Coal Co., 168 Northwestern Reporter, 684—was based on compensation for carrying coal while litigation was pending to determine the validity of an act passed by the North Dakota legislature in 1907, fixing maximum rates for the carriage of lignite coal. The rates were ultimately found by the Federal Supreme Court to have been confiscatory, and the railway company sought to recover the excess of what it conceived to be a reasonable transportation charge. The precise point decided by the North Dakota court in this suit is that the mere fact that a statute prescribing freight rates is finally held to be invalid as being confiscatory does not entitle carriers to enforce reparation against shippers.

Negligent Sale of Dynamite — Defendant coal-mining company kept on hand a supply of dynamite to be used by the miners in its employ whenever necessary to do any blasting, and sold it to the miners as they called for it. Two grades containing 40 and 60 per cent. dynamite respectively were kept for sale. Plaintiff, a miner, called upon defendant's storekeeper for a supply of the less explosive grade, and, supposing that he had obtained it, used the dynamite, tamping it in a drill hole in the manner in which he was used to safely handle the lower grade explosive. An accidental explosion resulted, rendering plaintiff permanently blind. In affirming judgment for \$10,000 in favor of the injured man, the Kansas Supreme Court decides that the jury's finding of these facts establishes actionable negligence on the part of the defendant, acting through its storekeeper. (Terleski vs. Carr Coal Mining and Manufacturing Co., 173 Pacific Reporter, 8.)

MEASURING DAMAGES FOR PERSONAL INJURIES-ING EMPLOYER'S DUTY—In reversing judgment which had been awarded in favor of a miner on account of injuries sustained by him through a fall of roof in the mine of the defendant in which he was working, the Alabama Supreme Court lately laid down the following rules governing the measure of damages to be awarded in Alabama when liability for personal injury is established, and the question whether an operator may delegate performance of certain acts to employees and thereby relieve himself from liability for any negligent performance of the delegated duties: "The measure of compensation to an injured employee is determined by the evidence (which may include mortuary tables, to show the probable duration of life) upon such factors as the age of the person, his business holds in the contract of the person, his business holds in the contract of the person, his business holds in the contract of the person, his business while industries and solviers when the contract of the person, his business while industries and solviers when the contract of the person in the person i ness habits, industry, and sobriety, usual earnings, skill, and whatever other relevant facts of the case would aid the jury in arriving at a fair and just compensation for his sustained pecuniary damages. The duty of the master, under the common law, is to exercise reasonable care to furnish the servant a reasonably safe place to This duty cannot be delegated. Yet the master may delegate the duty of exercising reasonable care to maintain such a place of work in a reasonably safe condition; and if such place becomes unsafe through the negligence of the servant to whom such duty is delegated, the master is not liable." (McCollum vs. South Brilliant Coal Co., 76 Southern Reporter, 901.)

The Hazard Coal Field

By P. M. SHERWIN Blue Diamond, Ky.

SYNOPSIS—Hazard coal is known chiefly for its hardness and low ash content. The region where it is produced is rough and mountainous, and presents many contrasts of old pioneer days and modern civilization. Much development work will doubtless take place in this field soon, and its future would appear to be assured.

MONG recently developed coal areas in the United States the Hazard field of eastern Kentucky is probably the most important as to present output as well as future prospects. Named after Hazard, the county seat of Perry County, it includes all the mines on the North Fork of the Kentucky River and its tributaries from Jackson to Whitesburg, Ky., a distance of about 80 miles. The territory is served by what was originally the Lexington & Eastern Ry., but is now a branch line of the Louisville & Nashville R.R., extending from Lexington to McRoberts, a distance of about 200 miles. Near McRoberts, 20 miles above Whitesburg, are the mines of the Consolidation Coal Co. and the Elkhorn Coal Corporation. But as these companies operate in the Elkhorn seam they must properly be designated as belonging in the field of the same name.

The railroad had reached Jackson early in the eighties, but there it stopped for nearly three decades until the rapid development and heavy demand for Elkhorn coal induced the Louisville & Nashville to extend its Jackson line in an effort to tap this rich field. At the time of its building little was thought of the coals in the Hazard field. However, great difficulties presented themselves to the penetration of the mountain ranges by the railroad builders, and when the headwaters of the Kentucky River were reached at McRob-

erts, it was decided to make this the end of the line. Thus it happens that the Hazard field today furnishes the greatest percentage of outgoing tonnage.

Prior to the completion of the railroad in 1912, the mountainous regions comprising Perry and Letcher Counties were known to the rest of the United States only by the stories of Fox and other writers. Hazard in 1912 had a population of 500, mostly housed in small shacks and log cabins. The next census will show 5000 people, living in a town with modern streets, electric lights and water-works.

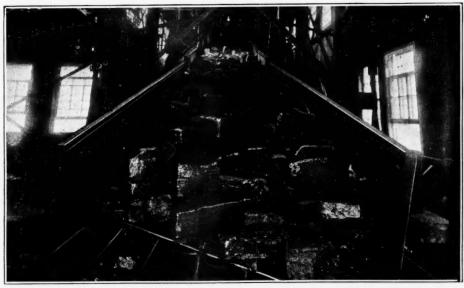
This shows truly remarkable progress, yet many circumstances tend to remind one still of the olden days. A few miles away we might find ourselves at some lone-some log cabin where even a hint of our modern civilization would seem far-fetched and out of place. The bloody family feuds and the battles between revenue officers and moonshiners have grown scarce, it is true, but every native still "totes" his gun and shootings are even yet fairly common; also many are the secret stills where corn mash is turned into the forbidden "moonshine."

In common with other mountainous and remote sections the country is quite crude. There are no roads worthy of the name. The native is still satisfied to ride to the postoffice, the store or the mill on his trusty mule. He is apt to regard the newcomer with suspicion and universally designates him by the name "furriner."

Slowly, however, a new spirit is penetrating from the mining camps into the distant, narrow hollows. When the native workman leaves the camp in the spring to plant his corn on the steep hillsides, he takes with him little bits of culture which eventually will work as the leaven in the loaf. Nevertheless, the most common habitation is still the log cabin. Even now the weekly supply of corn is taken to the mill strapped behind the saddle and the jug of illicit whiskey is yet found in the hollow tree in exchange for so much legal tender. Slowly

modern ways are penetrating from the valley of the Kentucky River to the most farflung ridges of the Cumberland and Black Mountains. The coal production of this region in five years has risen from zero to nearly 20,000 tons daily. Given the men necessary (and it is not a fanciful prophecy) five years hence the output will be more than doubled.

Geologically the field belongs to the Appalachian coalbearing measures. It contains three workable beds above the river valley. No. 3 seam is about 25 ft. above the river at Hazard. It is a little over 2 ft. in thickness, and con-



HAZARD COAL GOING THROUGH THE SCREENS IN THE TIPPLE

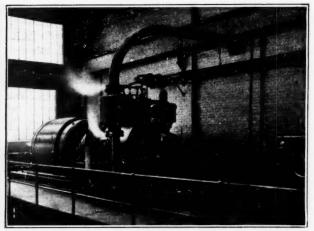
tains dirty coal of no commercial value. No. 4 seam, showing 48 in. of clean coal, is at tipple height and is probably of greatest importance of any coalbed in the field on account of its great consistency as to thickness and quality as well as extent in area. Seams No. 5 and 5A are of no value. Two hundred feet above No. 4 seam we find No. 6, with from 65 to 70 in. of coal, but containing a 4-in. band of jack rock 10 in. from the bottom. No. 7 seam is about 60 ft. higher and averages 72 in. of coal, but also carries a band of jack rock. On account of the rough nature of the country, showing heavy erosion and abounding in deep and numerous valleys, the Nos. 6 and 7 mining areas are much cut up. This renders a hard and fast system of development difficult. However, all the coal is universally mined on the room-and-pillar system, no longwall to the best of my knowledge being employed in any of the mines of this region.

It is principally due to the No. 4 bed that the fame of Hazard coals spread so rapidly and was followed by an influx of capital and consequently a still more rapid development. This coal was first shipped to the Northwestern market and gained fame as a high-grade One mile above Hazard at Lothair is the plant of the Kentucky River Power Co. It is a modern turbo-electric steam plant developing 6000 kw. It supplies all the larger mines in the district and furnishes light and power for the City of Hazard. Only one power plant is now in operation here. The power house is economically situated at the tipple of the Kentucky Jewell Coal Co., the slack being directly elevated from the screens to the overhead bunkers by bucket conveyors. In order to guard against interruption of the service on account of any failure of this particular mine an auxiliary conveyor can furnish coal from a track hopper.

There are two 1500- and one 3000-kw. turbines installed in this plant. At present the company supplies about twenty mines within a radius of 20 miles, with as many more new operations under contract. There are 60 miles of high-tension transmission line, carried on wooden poles; at the numerous river crossings, steel towers are being used. The current is three-phase, alternating with a voltage of 33,000. At the mines this is stepped down in oil transformers to 2200 volts and delivered at this potential to the coal companies.

Several coal companies with modern plants are lo-





INTERIOR OF BOILER HOUSE AND TURBINE ROOM OF KENTUCKY RIVER POWER CORPORATION

domestic fuel, as it is an extremely hard coal of low ash content. This quality strongly appealed to users of anthracite.

As a general rule, and on account of the extreme steepness and height of the hills, the companies operating the upper seams use retarding conveyors to bring their product to the railroad cars. A few plants employ monitors. Usually the coal is screened to three sizes. There are in all about thirty companies, with varying capacities in operation, along the North Fork of the Kentucky River. Seven more are located on First Creek, a tributary, 5 miles below Hazard, with a daily output of 100 cars. Ten are being opened on the new Lots Creek branch of the Louisville & Nashville R. R., with a proposed total daily capacity of 200 cars. These mines will ship with the opening of the railroad early next year. Tipples and towns have been built, headings are being driven and 50,000 tons of coal are mined and stored, waiting for the coming of the cars to help alleviate the nation's fuel shortage.

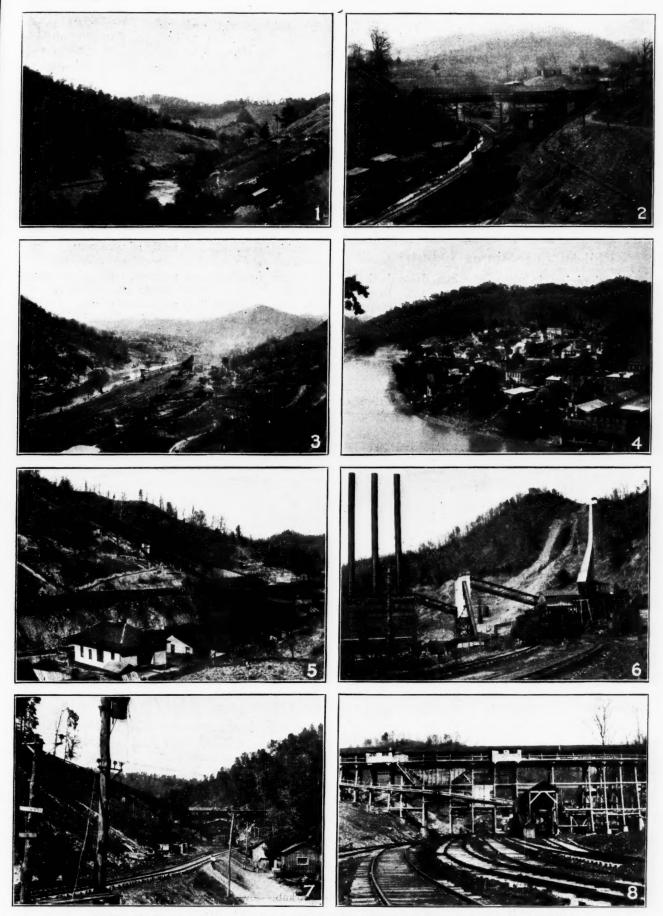
The Columbus Mining Co., the Daniel Boone Coal Co., the Blue Grass and the Hazard Coal companies are all operating in the immediate vicinity of Hazard and work seams Nos. 2 and 3 simultaneously.

cated along the river as far as the mouth of Carr's Fork. Here a branch of the Louisville & Nashville R. R. 8 miles long is under construction. This no doubt eventually will extend the full 28 miles of this not inconsiderable water-course. Rockhouse Creek at Blackey and Smoot's Creek at Roxana are the starting points for other branch lines, with mines operating and under construction. Several of the mines carry their coal across the river by means of cableways, but none of these are large producers. Mace's Creek, Leatherwood and Kingdom Come offer a vast undeveloped region and will no doubt see the building of branch lines soon.

Forty-five miles above Hazard lies Whitesburg, the county seat of Letcher County. The coal measures rise considerably faster than the river and at this point the lower seams of the Elkhorn field are exposed, thus taking the place of the Hazard coals which have mostly been eroded away with the tops of the mountains.

The Elkhorn coals, usually considered as belonging to the Big Sandy field, are much higher in volatiles and remarkably low in sulphur, and therefore form an excellent byproduct fuel.

The Lexington & Eastern, now known as the Eastern Kentucky Division of the Louisville & Nashville, is



VIEWS OF SURFACE PLANT AND MINING OPERATIONS IN THE HAZARD COAL FIELD

1—Carrs Fork Valley. 2—Daniel Boone Coal Co., No. 4 Seam Mine. 3—Louisville & Nashville yard at Hazard. 4—Partial view of Hazard. 5—Blue Grass Coal Co. 6—Kentucky Jewell Coal Co. and Kentucky River Power Co. 7—Blue Diamond Coal Co. 8—Hazard Jellico Coal Co.

essentially a coal road, the only other outgoing commodities being hardwood logs and barrel staves. Enormous quantities of white oak and other valuable woods grow along the upper reaches of the river and its tributaries. To give some idea of the curvature of the railroad line, it may be stated that the distance from Ravenna to Mc-Roberts by rail is 156 miles, while the airline distance is only about 75 miles.

The Hazard coal field has enormous possibilities for the future and the next few years should see the building of many more branch lines. This will be followed by the springing up of new towns and mining plants. A conservative estimate would place the daily capacity of this field at 35,000 tons, which should be reached in a few years time.

Chilean Coal-Mining Industry

The coal-mining industry of Chile dates back to 1849, when the first workings were opened. Development has been slow, compared with other comparatively new fields, like New South Wales and Japan. In Chile the development has been solely due to private enterprise, and consequently the progress has been slow and difficult. The first establishments, opening up

near the shore, had the advantages of proximity to marine transport; but, on the other hand, the difficulties of mining under the sea with the reduced extent of foreshore for working shafts, etc., had to be surmounted.

The first mines to be exploited were those of Lota and Coronel. Later on the Lebu mines, followed by the establishments of the Arauco Railway and Mining Co., Ltd., and the Compania Carbonifera Nos Rios de Curanilahue. Some smaller companies like the Lirquen. Rosal, etc., at Penco, and the Victoria at Lebu are of more recent origin. In Punta Arenas there are some

Two Tables That Will Prove

In coking coal, it is frequently advantageous to know what will be the ash and sulphur content of the coke produced from a coal of given analysis. In the accompanying tables, Table I shows the per cent. of ash in coke made from coals of various percentage of volatile matter and ash; the number of pounds of coal required to make one ton of coke (Column 1); the per cent. of ash increase from coal to coke (Column 22); and the rules for and calculations relating to the compilation of the

TABLE I. THE PERCENTAGES OF ASH IN COKE MADE FROM COALS OF VARIOUS PERCENTAGES OF ASH AND VOLATILE MATTER

Line	Pounds of Coal Required to Make 2000 Pounds of Coke	Pcr Cent. of Volatile Matter in the Coal		Per Cent. of Ash in the Coke										Factor	Per Cent. of Ash Increase from Coal to Coke									
Column	1	2	3	4	5	6	7	8	9	10	11	12	13	1	4	15	16	17	18		19	20	21	22
1 2 3 4 5 5 6 7 8 8 9 10 11 12 13 14 15 16 16 17 18 19 20 21 22 23 24 Per Cent	2,400 2,427 2,469 2,530 2,532 2,564 2,597 2,703 2,740 2,778 2,817 2,817 2,817 2,985 3,030 3,077 3,125 3,225 3,273 3,273 3,273 3,275 3,225 3,275 3,233	17. 00 18. 00 19. 00 20. 00 21. 00 22. 00 23. 00 24. 00 25. 00 26. 00 27. 00 28. 00 29. 00 31. 00 32. 00 33. 00 34. 00 35. 00 36. 00 37. 00 38. 00 39. 00 39. 00 40. 00	3. 00 3. 05 3. 13 3. 13 3. 20 3. 25 3. 28 3. 33 3. 48 3. 43 3. 58 3. 63 3. 73 3. 78 3. 85 5. 73 3. 85 6. 73 3. 85 6. 73 6. 74 6. 75 6. 75 75 75 75 75 75 75 75 75 75 75 75 75 7	3 . 66 3 . 69 3 . 78 3 . 78 3 . 84 3 . 93 4 . 93 4 . 11 4 . 17 4 . 29 4 . 35 4 . 41 4 . 53 4 . 62 4 . 62 4 . 62 4 . 62 5 . 01	4.27 4.31 4.38 4.41 4.48 4.59 4.63 4.87 4.90 4.87 4.50 5.12 5.29 5.39 5.57 5.57 5.74 5.85	4.88 4.92 5.00 5.04 5.24 5.32 5.48 5.56 5.64 5.72 5.80 6.04 6.36 6.36 6.36 6.56 6.68	5.40 5.49 5.64 5.63 5.67 5.85 5.99 6.17 6.26 6.35 6.71 6.80 6.71 6.80 6.71 6.71 6.71 6.71 6.71 6.71 6.71 6.71	6.15 6.25 6.30 6.40 6.55 6.55 6.75 6.85 7.15 7.25 7.25 7.35 7.70 7.80 7.80 8.20 8.35	6.71 6.88 6.93 7.04 7.15 7.21 7.32 7.43 7.54 7.765 7.76 7.88 8.09 8.31 8.58 8.75 8.86 9.19	7.32 7.38 7.56 7.68 7.86 7.86 7.88 8.12 8.34 8.46 9.24 9.24 9.36 9.54 9.54 9.66 9.54	7.93 8.13 8.13 8.32 8.45 8.52 8.65 8.78 8.91 9.04 9.17 9.30 9.43 9.56 9.82 10.01 10.14	8.5 8.6 8.7 8.8 8.9 9.1 9.1 9.3 9.3 9.5 9.5 9.7 10.0 10.1 10.2 110.4 110.4 111.4 111.4 111.6 9	4 9.1 1 9.2 2 9.3 6 9.6 6 9.6 7 9.9 1 9.9 1 0.2 3 10.1 5 10.2 6 11.0 6 11.0 7 11.3 1 11.5 1 11.5 1 12.3 1 12.5 3 12.5 3 12.5 3 12.5 3 12.5 3 12.5	55 9. 30 9. 55 10. 60 10. 55 10. 60 10. 61 10. 63 10. 63 10. 64 10. 65 10. 66 10.	76 100 84 10 000 10 24 10 40 11 448 11 164 11 128 11 144 12 26 12 22 12 28 13 38 13 21 13 41 14 14 12 14 14 12 14 1	.37 .46 .63 .71 .88 .05 .14 .31 .48 .65 .82 .99 .16 .33 .50 .16 .33 .50 .16 .33 .50 .16 .33 .50 .16 .33 .50 .50 .50 .50 .50 .60 .60 .60 .60 .60 .60 .60 .60 .60 .6	4.76 5.03	11.59 11.69 11.88 11.97 12.16 12.35 12.64 12.83 13.02 13.40 13.59 14.16 14.35 14.82 15.11 15.30 15.58	12. 2 12. 3 12. 5 12. 6 12. 8 13. 0 13. 1 13. 3 13. 3 13. 3 14. 1 14. 1 14. 1 15. 4 10 15. 4 10 16. 1 10 16. 7 10	0 12. 0 12. 0 13. 0 13. 0 13. 0 13. 0 13. 0 14. 0 14. 0 14. 0 15. 0 15. 0 16.	81 92 13 23 44 65 76 97 18 39 60 81 02 23 44 17 11 17 11 11 11 12 12 11 11 11 11 11 11 11 11	8.04	1. 20 1. 22 1. 23 1. 25 1. 26 1. 30 1. 31 1. 33 1. 35 1. 37 1. 41 1. 45 1. 45 1. 49 1. 51 1. 56 1. 56 1. 66 1. 66 1. 67	20.00 22.00 23.00 25.00 26.00 28.00 31.00 31.00 37.00 37.00 37.00 43.00 47.00 47.00 49.00 56.00 56.00 56.00 67.00
	of Ash in	the Coal	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.0	0 8.	50	9.00	9.50	10.00	10.5	50 1	1.00		

To find the percentage of ash remaining in the coke made from any given percentage of volatile matter and ash in the coal charged, follow the line corresponding to the given volatile matter to its intersection with the column corresponding to the given ash in the coal charged.

For example: Coal charged contains 30 per cent. volatile matter and 6.50 per cent. ash. At the intersection of line 14 with column 11 it shows 9.30 per cent. as the ash remaining in the coke.

Rule: To find the percentage of ash in coke from any given volatile matter and ash in coal, multiply ash in coal by factor in column 21 corresponding to the given volatile matter. For example: Coal 30 per cent. volatile matter, line 14, and 6.50 per cent. ash, column 11. Factor 1.43, line 14, column 21.

6.50 ash × 1.43 factor = 9.30 per cent. ash in the coke (nearly).

Rule: To find per cent. of increase from coal to coke, subtract 1 from factor. Example: Line 14, volatile matter, 30 per cent., factor 1.43, column 21.

1.43 — 1 = 43 per cent. ash increase.

Rule: To find per cent. of ash in coal from any given ash in coke and volatile matter in coal, divide ash in coke by factor.

Example: Line 14, column 17, ash in coke 9.30 per cent., line 14, column 21, factor 1.43:

9.30 / 1.43 = 6.50 per cent. ash in coal.

Calculation to determine factor:
Per Cent.
Volatile matter..... 30.00 Ash.... Fixed carbon..... 6.50 Coke 70 per cent. 100.00 100 parts coal contain 6.50 per cent. ash 70 parts coke contain 6.50 per cent. ash 100 parts coke contain 6.50 × 100 = 9.30 per cent. (nearly) ash in coke Ash in coke = $\frac{9.30 \text{ per cent.}}{2.30 \text{ per cent.}} = 1.43 \text{ (nearly) factor.}$ Ash in coal = 6.50 per cent.

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older workings, which supply fuel to the steamers, and in the province of Valdivia there are some new mining developments at Millahuillin. The coal production up to, and including 1914, amounted to a total of 32 mil-

This development has not been contributed to by the state, in the provision of a single railway, port works, or efficient geological survey of the carboniferous regions, to give the necessary impetus to the local industry. The high price of coal is in a great measure due to this neglect on the part of the government to

Valuable in Coking Practice

table. Table II shows the volatilization of various percentages of sulphur during the coking process in coals of different volatile contents, the number of pounds of coal required to make one ton of coke and the rules and calculations relating to the compilation of the table. These tables are practically self-explanatory and require no further comment. They will be found useful not only to those who are already interested in coking but also to those contemplating going into the manufacture of coke.

encourage the national industries and the general prosperity. Now there is a persistent outcry against the "impoverishing of the country" by spending 30 to 35 millions of gold pesos annually on imported coal, and interested parties are clamoring for the imposition of import duties on foreign coals.

This is only aggravating the evil, by swelling the dividends of a few fortunate shareholders at the expense of the suffering public and increasing the price of an indispensable article, which is rapidly attaining to the rank of a luxury. What is absolutely necessary is good harbors, sufficient feeder railways running to the coast, and adequate rolling stock.

The Chilean coals all belong to the lignites of the tertiary period. The territory exploited up to date, which forms the productive zone of the carboniferous system of the provinces of Concepcion and Arauco, measures some 980 sq.km. This is comprised in a belt 90 km. in length by 10 to 11 km. wide.

The principal mining centers are the Bay of Arauco, where the workings of the Lota and Coronel companies are situated, and the eastern zone of the province of Arauco, at the foot of the Nahuelbuta cordillera. The workings of Lota and Coronel extend under the sea

TABLE II. THE VOLATILIZATION OF VARIOUS PERCENTAGES OF SULPHUR IN COALS OF DIFFERENT VOLATILE MATTER CONTENTS, DURING THE COKING PROCESS BASED ON VOLATILIZING 40 PER CENT. OF THE SULPHUR IN THE COAL

Line	Pounds of Coal Required to Make 2000 Pounds of Coke	Per Cent. of Volatile Matter in the Coal		Per Cent. of Sulphur Remaining in the Coke												Factor	Per Cent. of Sulphur Decrease from Coal to Coke					
Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 22 22 24 Per Cent Coal C	2,400 2,427 2,469 2,502 2,532 2,564 2,531 2,631 2,703 2,740 2,778 2,817 2,898 2,941 2,985 3,030 3,175 3,125 3,225 3,225 3,233 of Sulphuharged:	18.00 19.00 20.00 21.00 22.00 23.00 24.00 25.00 25.00 26.00 30.00 31.00 33.00 33.00 33.00 33.00 33.00 33.00 34.00 35.00 38.00 37.00	0.586 0.590 0.605 0.614 0.629 0.638 0.658 0.667 0.672 0.775 0.775 0.773 0.773	0 . 62: 0 . 63: 0 . 64: 0 . 65: 0 . 66: 0 . 66: 0 . 66: 0 . 70: 0 . 70: 0 . 72: 0 . 74: 0 . 75: 0 . 76: 0 . 76: 0 . 78: 0 . 78:	2 0.648 2 0.659 7 0.664 8 0.675 3 0.680 3 0.702 8 0.702 9 0.703 8 0.712 9 0.75 9 0.75 9 0.75 9 0.75 9 0.75 9 0.75 9 0.832 0.842 0.842 0.859 0.869 0.869 0.869 0.869 0.869 0.869 0.869	0.695 0.701 0.713 0.718 0.730 0.747 0.750 0.776 0.781 0.792 0.804 0.815 0.827 0.838 0.849 0.861 0.878 0.935 0.935 0.935	0.732 0.756 0.756 0.768 0.780 0.780 0.786 0.798 0.810 0.822 0.854 0.870 0.870 0.870 0.924 0.936 0.954 0.966 0.966	0. 769 0. 775 0. 778 0. 808 0. 819 0. 825 0. 836 0. 876 0. 876 0. 926 0. 939 0. 951 0. 970 0. 983 1. 002 1. 013 1. 033 1. 052	0.80:0 0.81:0 0.82:0 0.83:0 0.84:0 0.85:6 0.85:6 0.90:0 0.90:0 0.93:0 0.93:0 0.94:0 0.95:0 0.98:0 0 0.98:0 0 0.98:0 0 0.98:0 0 0.98:0 0 0.98:0 0 0.98:0 0 0.98:0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	60.842 0.863 0.863 0.863 0.897 0.904 0.918 0.932 0.945 0.971 1.001 1.014 1.028 1.042 1.063 1.077 1.111 1.1152	0.878 0.886 0.900 0.907 0.922 0.936 0.973 0.978 1.011 1.011 1.030 1.044 1.073 1.087 1.123 1.145 1.151 1.181 1.181	0.915 0.923 0.938 0.938 0.945 0.960 0.975 0.983 1.013 1.028 1.043 1.073 1.088 1.133 1.133 1.133 1.170 1.170 1.193 1.238 1.238	0.952 0.959 0.975 0.983 0.998 1.014 1.022 1.037 1.069 1.084 1.115 1.131 1.162 1.178 1.201 1.217 1.240 1.259 1.303	0. 988 0. 996 1. 013 1. 021 1. 037 1. 053 1. 061 1. 077 1. 110 1. 126 1. 142 1. 158 1. 175 1. 207 1. 223 1. 264 1. 288 1. 328 1. 328 1. 328	1 . 025 1 . 033 1 . 058 1 . 075 1 . 092 1 . 100 1 . 1134 1 . 151 1 . 168 1 . 235 1 . 235 2 . 252 1 . 268 1 . 310 1 . 336 1 . 336 1 . 378 1 . 378 1 . 378	1. 061 1 070 1 088 1 096 1 114 1 131 1 157 1 175 1 175 1 209 1 227 1 242 1 262 1 279 1 340 1 357 1 383 1 401 1 427 1 453	1. 098 1. 107 1. 125 1. 134 1. 152 1. 170 1. 179 1. 197 1. 293 1. 251 1. 233 1. 251 1. 233 1. 251 1. 353 1. 341 1. 359 1. 344 1. 431 1. 449 1. 449 1. 476 1. 503	1 135 1 144 1 163 1 172 1 190 1 209 1 218 1 237 1 256 1 274 1 330 1 349 1 349 1 349 1 349 1 432 1 451 1 479 1 479 1 479 1 525 1 553	1 171 1 181 1 200 1 210 1 229 1 248 1 258 1 277 1 395 1 334 1 354 1 374 1 372 1 411 1 430 1 478 1 546 1 546 1 574 1 603	1. 267 1. 287 1. 297 1. 317 1. 337 1. 356 1. 376 1. 396 1. 416 1. 436 1. 435 1. 475 1. 475 1. 525 1. 525 1. 525 1. 524 1. 574 1. 594 1. 624 1. 653	0.720 0.732 0.738 0.750 0.756 0.768 0.786 0.786 0.810 0.822 0.834 0.846 0.870 0.882 0.870 0.882 0.870 0.894 0.906 0.906 0.954	28. 00 26. 20 25. 00 24. 40 23. 20 22. 00 21. 40 20. 20 11. 80 11. 80 11. 60 9. 40 7. 60 6. 40 4. 60 0. 00

To find the percentage of sulphur remaining in the coke made from any given percentage of volatile matter and sulphur in the coal charged, follow the line corresponding to the given volatile matter to its intersection with the column corresponding to the given sulphur in the coal charged. For example, coal charged contains 30 per cent. volatile matter and 1.20 per cent. sulphur. At the intersection of line 14 with column 11 it shows 1.030 per cent., the sulphur remaining in the coke.

Rule: To find the percentage of sulphur in coke from any given volatile matter and sulphur in coal, multiply sulphur in coal by factor in column 21 corresponding to the given volatile matter. For example: Coal 30 per cent. volatile matter, line 14, and 1.20 per cent. sulphur, column 11, factor 0.858, line 14, column 21.

1.20 sulphur × 0.858 factor = 1.03 per cent. in the coke (nearly).

Rule: To find per cent. of sulphur decrease from coal to coke, subtract factor from 100. Example: Line 14, volatile matter, 30 per cent. Factor = 0.858.

100 — 0.858 = 14.20 per cent. sulphur decrease.

Calculation to acquire factor:
100 parts of coal contain:
Per Cent.
Volatile matter,
Ash,
9.30
9.30
Fixed carbon,
60.70

14.20 per cent. sulphur de
Calculation to acquire factor:
Per Cent.
93.00
9.30
9.30
9.30
9.30
9.30 Ash, Fixed carbon,

To make 2000 lb. of coke. 2000 ÷ 70 per cent. = 2857 lb. of coal required. 1. 20 per cent. sulphur in the coal

34. 284 total pounds of sulphur in the coal 40 per cent. of the sulphur volatilizing

13.7136 lb. of sulphur volatilizing

Lb. 284 -- 13.7136 = 20.5704 lb. = remaining in the coke, or 1.03 per cent. (nearly) 2000 lb.

Formula for per cent. of volatilization.

Let a = Pounds of sulphur in coal charged;
b = Pounds of sulphur remaining in the coke;
x = Per cent. of volatilization.
a — b

a

a 34. 284 — b 13. 7136 = 40 per cent. s - 34.284

= 1.03 per cent. = 0.858 factor. Sulphur in the coke Sulphur in the coal

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1200 to 1400 m., and it will be difficult to work more than 3000 m. from the coast. Notwithstanding this limitation, there is a capacity of 40 million tons for future production.

In the eastern region of the province of Arauco, which seems to be the same system as that of Arauco Bay, the coal beds are inclosed in 540 ft. of soil of a carboniferous formation, which includes the district from Peumo and Colico to Cullinco, through Carampangue, Curanilhue and Pilpico. This is where the mines of the Arauco Mining Co., Ltd., and the Ruos de Curanilahue Co. are situated. These are the best and most productive developments. The work is carried on under decidedly different conditions from those existing in the submarine workings on the coast. The entire output is transported by the Arauco Co.'s railway.

FIRST COMPANY ORGANIZED WITH BRITISH CAPITAL

The Arauco Railway and Mining Co. was the first company organized for the exploitation of the coal beds in this region, and the construction of a railway running through the carboniferous region north to Concepcion. This was done with British capital, the Chilean government giving a guarantee for interest on the amount invested. It was only necessary to fall back on the guarantee during the first few years. After this the undertaking has been self-supporting, and it is understood that the guarantee money has been refunded.

South of these mines lies the new center of Pilpico, with the most magnificent deposits of the whole region. This is followed by a carboniferous district, 18 km. in length, as far as Cullinco, as yet unexplored, and which will produce the largest supplies of the future. The new railway from Curanilahue to Los Alamos will open up this region and connect the entire district to the coast, at the port of Lebu.

The river, in its journey to the sea, passes the oldest colliery district in the province of Arauco—the Errazuriz Establishment (which is now owned by the Curanilahue Co.), the Victoria and the Millaneca companies. The development of the Lebu mines has been sorely hampered, owing to the difficulties of the port, or rather to the lack of a proper port, as the formidable sand bar keeps everything over 200 tons outside in the open roadstead. The new railway from Los Sauces to Lebu via Canette will bring to the port of Lebu the coals of Curanilahue (which at present go by rail to Talcahuano), those of the new region between Curanilahue and Los Alamos, as well as those of the Lebu mines. It will therefore create a coal shipping center.

The Southern Railway Construction Co., which has been unable to complete the railway owing to the lack of sufficient capital and certain unforeseen difficulties, will no doubt eventually be bought out by the Chilean government and the work concluded, together with the necessary harbor works at Lebu. This railway will eventually be the main artery from Argentina to the Pacific, through the pass of Longuimay.

North of the Bay of Arauco there are found small coal deposits at Penco, in the Bays of Coliumo and Talcahuano, where the mines of Cerro Verde, El Rosal and Lirquen, about 2 miles from Penco, are being exploited. The coal from these mines is different in character from the others, being of a soft nature, and producing a coke that crumbles easily.

There are other lignite mines in the extreme south of Patagonia, within easy distance of the Port of Punta Arenas. The bed which is at present being exploited is 6 ft. thick and of an inferior quality. A local railway brings the coal to port.

According to data and statistics published in 1910, and the analysis published in the "Boletin de Geografiay Minas" in 1913, in the mines of Cerro Verdo, Lirquen and Rosal, in the region of Talcahuano, the heat content varies between 5764 and 6351 calories. The coals of Valdivia in the Region of Millahuillan belong to the same class. In the tests made by the State Railway Department these coals prove to be 25 per cent. inferior to the coals of Lota, Coronel and Arauco.

In the regions of Lota, Coronel, Collico, Curanilahue, Pilpico, Los Alamos, Cullinco, Lebu and Loreto, in Magallenes, the heat content varies between 7404 and 5156 calories. All these coals produce a compact coke, but which, owing to its chemical composition, is unsuitable for smelting purposes.

Owing to the war, the gas companies, which were previously dependent upon Australian coal, have been thrown back on Chilean material. The Santiago Gas Co. is modernizing its plant under the direction of a technical expert, who states that from experiments made on an extensive scale the Coronal coal gives the best results—results which compare favorably with those of the best Australian coal in quality and quantity of gas. The inferiority of Chilean coke rests principally in its friability, as its other properties compare favorably with the gas-cokes obtained from foreign coals.

The gross production in 1914 was 1,086,946 tons, the net amount sold being 944,829 tons. In 1915, which was also slightly below the average of the previous five years, the total production was 1,171,564 tons, or 1,050,874 tons sold. In 1914 and a part of 1915, with the nitrate and shipping trades practically at a standstill, the mines were obliged to reduce their output, but when trade was again opened, the collieries entered upon a period of unprecedented activity.

In analyzing the comparative outputs of the manual labor, one is struck with the low average production per operative employed in the Chilean mines, compared with that of other countries, especially Great Britain and the United States. This is due to a variety of causes, such as the difference in the thickness of the beds, the notably capricious nature of the deposits, and the conservatism of the owners, who prefer to drag along with manual labor, instead of introducing labor-saving machinery.

The comparative annual production per operative employed is given as follows: The United States, soft coal, 550 tons, anthracite, 380 tons; Great Britain, 280, Germany, 250; France, 200; Chile, 153; Belgium, 150.

The calorific value of coal is obtained by burning it in a calorimeter. At the same time the temperature of the burning coal can be determined by means of an electric thermometer. A fine high resistance wire is inserted in the combustion chamber of the calorimeter; the resistance of this wire is determined at the beginning of the test and during combustion. There is a definite relation between temperature and resistance and by this method the greatest temperature possible from a given coal can be determined.

Who's Who In Coal Mining

William Leckie

When we conjure up the vision of Colonel William Leckie, as we have seen and known him, he "comes up smiling." Cheerfulness, they say, is a religion with the Colonel, for he has read and mastered the Gospel of the Grin. Have it your own way. All we know is that the Colonel has a heart as warm as his smile is genial, that the bewitching curve of his facial muscles is an outward and visible sign of his inward and invisible heart's warmth—a warmth as genial as that generated by the product of his coal mines.

Colonel Leckie's good will is exhibited not only to his friends and to strangers, but to the hundreds who are in his employ. He not only feels kindly toward them, but serves them faithfully as their employer, providing



COLONEL WILLIAM LECKIE

liberally for their comfort and welfare. Probably this is because this successful Scot has been "through the mill," for he has not always been a coal operator.

Time was when he worked in the mines himself, not only in this but in the old country, and hard work it was, for his parents needed his labors, seeing that he was the oldest of 14 children. His parents were Samuel and Kate McClelland Leckie. He was born on the Smith farm, in Ayrshire, Scotland, near the birthplace of Scotland's poet, Robert Burns. It was not a very cheerful prospect when, as a lad, he went to the mines. Can it be that his life-long smile was incubated then amid those none too favorable surroundings? We can only wonder. The Colonel is not a man to dilate on his troubles or his hardships other than genially. Later he helped on the farm, and until he was of age part of his working time was spent on the surface and part in the mines-an amphibious existence not uncommon among the mining population.

When he was of age he came to the United States, settling in Shenandoah, Schuylkill County, Pennsylvania, whither his father followed him six months later.

William Leckie's first work in the mines in Pennsylvania was as repairman. Inspired by an ambition to

equip himself for greater usefulness in life, young Leckie at the age of twenty-three entered Dickinson Seminary, at Williamsport, remaining there for two years and a half, seizing every opportunity to improve himself mentally and yet at the same time participating in all the activities of the institution where he was a student. He had as a very young man in Scotland been regarded as one of that country's best athletes. He demonstrated the same prowess as a student at Dickinson, and it goes without saying that he was a general favorite among the student body.

Soon after leaving college William Leckie was united in marriage to Miss Annie M. Kalb, daughter of the Rev. F. H. Kalb, a Presbyterian minister of Shenandoah, and to that happy union six children were born—Jean E., Nellie K., Andrew F., William S., Douglas E. and Miriam G. Leckie.

Possessed of an excellent education, William Leckie became successively fireboss for the Philadelphia & Reading Coal and Iron Co., inside foreman for the Buck Mountain Coal Co., near Delano, Penn., district superintendent of the Lehigh & Wilkes-Barre Coal Co., and finally general superintendent of the Lehigh Valley Coal Co.'s York Farm and Blackwood collieries, a position fraught with much responsibility.

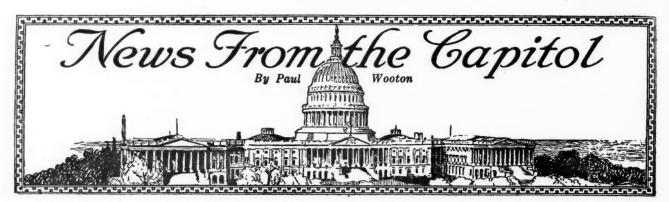
His ability as a mining executive being widely recognized, William Leckie in 1894 was appointed general superintendent of the Aronfield Coal and Coke Co., near South Fork, Penn., and two years later he became general manager of the Loyal Hanna Coal and Coke Company.

Coming to West Virginia in 1901 as general superintendent of the Pocahontas Collieries Co., which opened up the famous Pocahontas coal fields, Colonel Leckie had a direct and responsible part in developing the properties of the Pocahontas mines, which eventually were acquired by the Pocahontas Consolidated Collieries Co. For six years William Leckie remained with this company. A man of sound judgment, William Leckie was also a man with a vision, though far from visionary, and he foresaw the great mineral possibilities of southern West Virginia. As a result he finally, in 1907, started in business for himself. Just how successful he has been is best attested to by the fact that he is now president and general manager of the following companies: West Virginia Pocahontas Coal Co., Lathrop and Panther Coal companies, Leckie Collieries Co., Leckie Fire Creek Coal Co. and the Douglas Coal Co. The general offices of all of the Leckie companies are at Welch, W. Va., where Colonel Leckie resides. In addition to his numerous coal holdings, Mr. Leckie is president of the Pond Creek Coal and Land Co. and of the First National Bank of Anawalt, as well as a director or stockholder in other business concerns.

Colonel Leckie's kindness to his employees is proverbial. Reference has already been made in *Coal Age* to his thoughtfulness of the mental, physical and spiritual welfare of those who are connected with his plants, but too much stress cannot be laid on the fact that he has sought to make the surroundings of the miners such that they would be happy and contented.

Though a native of Scotland, William Leckie esteems it a privilege to have become an American citizen, marrying an American wife and bringing up an American family who cherish American ideals.

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Senate Investigating Committee Gathers Testimony on Hard Coal Situation

William Wilhelm, an attorney of Pottsville, Penn., in his testimony before the Senate Committee on Manufactures, which is continuing its investigation of the coal situation, ascribed the following reasons for the shortage of anthracite coal:

- 1. Refusal of operators to lease or to ship culm banks.
- 2. Refusal to allow the equipping of collieries to mine some of the very best deposits of coal—those which can be easily won.
- 3. Failure to join in the campaign for a larger production of coal.
 - 4. Penalizing the brains of the willing workers.
- 5. Intemperance growing out of the fact that the breweries control the political situation in the anthracite fields.
 - 6. Poor housing conditions.
 - 7. Corporate landlords not opening mines themselves.
 - 8. Excessive royalties.
 - 9. Excessive tolls.

He cited the Girard estate as the best example of the payment of excessive royalties. He stated that the estate is getting as high as \$1.40 a ton on prepared sizes of Locust Mountain coal. He says the trustees of the estate are taking the wealth of Schuylkill County and planting it in Philadelphia at the rate of millions a year. This led Senator Vardaman to state that "with the authority vested in the Federal officials, there is no reason why they should not have forced a change."

Mr. Wilhelm was particularly severe in his criticism of the breweries, on whom he fastened much of the blame for shortage in anthracite production. He declared that, in normal times, most of the stockholders in the big anthracite-producing companies live out of the country and that the business is run so as to squeeze out every possible dollar of profit. Coal is held in the ground, he declared, to keep it off the market. On being questioned, however, he afterward was forced to admit that there was no shortage of anthracite, except during strikes, until November, 1917.

William Griffith, of West Pittston, Penn., a mining engineer and geologist, told the committee that anthracite has reached the peak of production. He expressed the opinion that the Fuel Administration should have arranged a secondary grade of anthracite coal which could have been sold at a lower price. He said the clean coal regulation was wrong to the extent that it forced the grinding down of small sizes so they would come within the regulations in regard to impurities. In order

to supply the demand during the war, he asserted that posterity has been robbed by gouging the mines of the more easily mined coal. He took issue with statements to the effect that schools were poor and living conditions bad in the anthracite region. He declared it was one of the most prosperous sections in the entire United States. He explained in detail why anthracite operators could not extend their mining activities indefinitely.

Jonathan Day, the commissioner of public markets in New York City, was outspoken in his condemnation of the Fuel Administration and the fuel administrator of New York. He declared the municipal authorities had plans perfected to give the poor people cheaper coal. The refusal of Federal authorities to allow the carrying out of the plan has made it necessary for the poor of New York to pay \$3,000,000 more for their coal this winter.

The committee was surprised when Delos W. Cooke, the fuel administrator for New York, followed on the stand and displayed the entire correspondence between himself and the mayor of New York, showing that they were in entire accord. Mr. Cooke declared there would be no anthracite shortage in New York this winter, and despite Mr. Day's assertion to the contrary, declared there would be plenty of peddler's coal for the poor. He declared that the great majority of the poor would not traverse the long distances between the projected coal piles to save five or ten cents a bucket on coal. He went into detail as to the steps which have been taken to prevent a recurrence of the shortage of last winter. Principal among these was the appointment of an official to have entire charge of ice-breaking operations. Despite the heavy recent movements to the lakes and to New England, he declared that the deliveries are only 350,000 tons behind on New York's quota.

Gary N. Gray, of Scranton, Penn., the general manager of the Wolf Creek Coal Co., who has been forty-three years in coal-mining activities, was another witness. For the last twenty years he has been washing culm. Despite vigorous questioning, members of the committee were unable to show by his testimony that the big operators were at fault in not having worked their culm banks. Many washeries, he asserted, are closing because they cannot afford to pay the increase in wages. The demand for culm is also slack, he believes, from the fact that he has a number of cars under demurrage.

F. C. Reese, auditor for the Pennsylvania highways department, stated that the labor shortage in the anthracite region was due more to poor living conditions than to the draft or for any other reason.

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W. S. Tompkins wired the committee from Wilkes-Barre, asking it to ascertain if the gas being allowed to escape from anthracite mines cannot be conserved. The committee was advised that the best heat units are lost in this manner, but no one vouched the opinion that it is practicable to save this gas.

Holiday Affects Coal Production

The Thanksgiving holiday cut heavily into both bituminous and anthracite production. With the ending of the war the men do not feel the same responsibility, and the cases were many where absence from work extended from Wednesday noon until Monday morning, according to advices reaching Washington. Despite the series of circumstances which have interfered with anthracite production the feeling in Washington is that requirements for that fuel are going to be so nearly met that no hardship will result.

Planning for a Large Export of Coal

Out of the changes resulting from the war will come a new policy respecting the exportation of coal, officials here believe. It is regarded as probable that the Government will establish foreign coaling stations. Much, too, will depend on the policy along which the merchant marine is conducted. Heretofore there has been no empty tonnage leaving our shores but, it is expected, conditions will have changed a year from this time. The reduction in the amount of exports to Europe and the completion of a large number of new ships will make available bottoms for coal exports.

If the United States should become a heavy exporter of coal, important changes would be brought about in the use of coal by domestic industries in certain sections. The only coal which could be exported with profit would be the high-grade product. This would necessitate the universal use of low-grade coal by domestic industries, Government specialists believe.

Bush Resigns as Head of Priorities Division of Fuel Administration

D. D. Bush, of the Peabody Coal Co., of Chicago, who has been devoting his time to Government work since the war, has resigned as head of the Priorities Bureau of the Fuel Administration. Mr. Bush will return to the service of the Peabody Coal Co. On first coming to Washington, Mr. Bush served the committee on coal production of the Council of National Defense. Then he went with the Fuel Administration until drafted by the Bureau of Mines to assist in the administering of the explosives act. Some months ago he returned to the Fuel Administration to assist in priority matters.

The Priorities Bureau is to be continued for the present under the direction of H. E. Brennick. Coal operators are having considerable trouble in getting delivery on important supplies, and it is believed that the Fuel Administration can render further assistance in transportation matters.

German coal and coke allowed for exportation to Sweden during the month of September amounted to 133,100 tons, or 17,000 tons less than the month previous.

May Abolish Soft Coal Prices

Price and zone restrictions on bituminous coal probably will be abolished on Dec. 15, Dr. Garfield has announced. The work of the administration, except that pertaining to anthracite, will have been so nearly completed by Jan. 1 that only a nucleus of each bureau will be maintained. The statistical bureau of the Fuel Administration is to be taken over by the Geological Survey. The engineering bureau, the power bureau and the conservation bureau will be taken over by the Bureau of Mines.

French Coal Mines in Bad Shape

Eight months must elapse before any production of coal may be expected from the mines at Lens, France. It will require three years to restore them to normal operation. This is the opinion of the Fuel Administration's commission, which now is in Europe. The Commission has conferred in Paris with the French authorities in the hope that it could make some helpful suggestion.

Clay Products Industries Save Much Coal

At least 1,500,000 tons of coal was made available for other purposes during the first half of the current year by the restrictions placed upon the clay product industries. Had the restrictions remained in effect throughout the year, the saving would have been at a higher rate, as many plants chose to burn their entire allotment of fuel and then close down entirely.

Brief Washington Notes

All restrictions on the use of fuel by florists and by the manufacturers of window glass, clay products and cement have been removed. The restrictions on fuel for breweries will be continued.

A coal handling plant capable of handling 500 tons per hour is to be erected on the waterfront at New Orleans. A storage bin will be provided with a capacity of 25,000 tons. The plan has been laid before the Fuel Administrator.

All restrictions on the movement of coke to and from New England have been removed. To save cross-hauling and traffic that could be dispensed with, the Fuel Administration last May placed an embargo on shipments through New England gateways.

Adjustment of zones west of Pittsburgh is under consideration. Unexpected slackening of demand is adding materially to the surplus coal in those zones. It is believed, however, that considerable relief can be afforded by certain shifts of the zone lines.

No leniency with regard to the clean coal order may be expected because peace is in sight, the Fuel Administration announces. It is continuing to close down mines that do not properly prepare their coal. More than 100 mines have been ordered closed for that reason.

Storage of coal at Pittsburgh was allowed to begin immediately following the completion of deliveries for Lake shipments. In order to insure the supplies needed in the Northwest, it was necessary to limit all domestic and industrial storage in the Pittsburgh district to actual necessity.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

Perhaps the best labor news is the account of the labor unrest in Silesia, a part of German Poland. It is certain, of course, that German coal will never invade United States markets, but if wages were to remain low in Germany and at the same time coal were cheap, there would be a possibility of an underselling of our market by goods made in Germany; or, if not in Germany, in other countries with German coal or in other countries with the coal of those countries, cheaply mined by reason of the fact that, modeled on Germany, the wage scale in those countries continued to be low. These considerations made increased wages in Germany desirable, and also shorter hours. At last that desirable consummation seems to have been reached.

The Silesian mine workers are quite largely Poles and Russians. Formerly there was a large admixture of Entente prisoners. The prisoners are leaving, as might be expected. The Poles, not daring to revolt, are not unwilling to strike—anything to make trouble for the government. And with the Russians the magic word "Svoboda," which is supposed to mean "freedom," but in effect usually means "idleness," has done its fateful work. Wages in Silesia seem to have risen like those in Russia and are vainly striving to overtake the cost of living.

The miners were getting recently 25 marks (\$5.95) per day of nine hours. They demanded the same pay for only a six-hour day. When the owners acceded to that the workers then demanded 30 marks (\$7.14) for six hours. The Polish workers are believed to seek a continuance of the trouble so that they can seize the mines and declare them the property of the unions. The strike, therefore, is partly genuine labor trouble, partly socialism and partly politics. But whatever it may be, it promises good to the workers of the United States. The wage inequality is now on its way to readjustment, in fact is already readjusted. When all is done, it is likely that the walls of autocracy having fallen, the wage waters will tend to a level regardless of national lines.

We now approach the new election of officers of the United Mine Workers of America. It would seem that John P. White, like a soldier laddie, should be allowed to return to his former office now that the forces of the Fuel Administration are being demobilized and now that John P. White has sent in his resignation to the fuel board. The election will be held on Dec. 10.

Frank J. Hayes is a candidate for reëlection, having received the vote of 739 locals. John H. Walker, of Danville, Ill., a man of more radical tendencies, was nominated by 225 locals. John Lewis, who has been vice-president and desires to succeed himself, has been nominated by 880 locals. Opposed to him is Tom Kennedy, of Hazelton, president of district No. 7. He has only 23 locals behind his nomination.

Owing to the fact that there is a majority of bituminous mine workers in the union, the offices now always go to bituminous men. There are no party lines about this matter and no really clannish feeling, but the bituminous miners like to have bituminous labor leaders to settle their difficulties, and the anthracite men would like to have anthracite leaders. The bituminous mine workers always gain the day, owing to their greater numbers.

William Green, the secretary of the United Mine Workers, also seeks reëlection. He is opposed by J. L. Sims, of Linton, Ind. The greater number of nominations received by the present incumbent of the office appears to foreshadow his election.

The operators of the anthracite region are trying their utmost to meet the difficulties of the hard-coal situation. The promise that anthracite miners will be speedily demobilized offers some relief, if only there are not too extensive celebrations on their homecoming. Those in France may be some time coming home, and perhaps those who have not seen active service will be allowed to take their places in the ranks without any great consumption of time for a well-merited jubilation. However, it will almost pass belief if Scranton, Wilkes-Barre and Pottsville are not the centers of some few days of festival making "when the boys come home."

With the termination of hostilities miners in West Virginia fields are not inclined to work quite as regularly as they did when special appeals were being made to them to furnish coal for war purposes. In some districts their leaders do not and have not encouraged increased production at any time.

Labor organizers are still active in the Fairmont region, although that field is pretty well organized by this time. One of the latest local unions formed was that at the No. 7 Jamison mine of the Jamison Coal Co. Two strikes of minor importance have occurred in the Fairmont region within the last ten days. One was at the mines of the Orr Coal Co., between Fairmont and Clarksburg, the miners walking out after a dispute with officials. About 60 men are employed by the company. The trouble was adjusted within 24 hours and the men returned to work. A strike of a similar kind at the Rock Island mine in Barbour County was adjusted without much loss of time after the miners had presented their demands. About 150 men are employed at this operation.

A miner, by the name of Nick Gurkovich, employed in the Zeigler mine, has what is claimed to be the state record for loading coal. This was 333 tons for a single pay period of two weeks' duration. This pay period was the last half of October. The average for the entire mine was 13.7 tons for each loader for every work day in that pay. This high tonnage is due to the fact that the "turn" has been abolished and the men get every car they can load.

The United Mine Workers of America against the Hartford, the Coronado, the Mammoth and Prairie Creek Coal companies, all operating in Arkansas, comes up in the United States Court of Appeals, Tuesday, Dec. 10. This is a case where the operating companies obtained a \$600,000 judgment against the mine workers of Arkansas in the District Court at Fort Smith, Ark., for the alleged malicious destruction of mine property during a strike. It will be remembered that the strikers deliberately destroyed by fire and other means tipples and plants of the mining companies in Arkansas which were idle when the company refused to run the mine on a union basis.

A conference of miners of District 18, which includes the eastern Section of British Columbia and the Province of Alberta, will be held on Jan. 6. At this meeting problems relative to coal-mining operations within the limits of that section and the men's attitude toward the same will be exhaustively discussed.

Thomas Graham, superintendent of the Canadian Collieries (Dunsmuir) Ltd., states that influenza has severely handicapped him in maintaining the output of the several mining properties under his charge. He asserts that the number of men who have laid off work for periods of varying length during the past few weeks runs into the hundreds. It has been impossible, therefore, to keep production up to the maximum point during November.

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EDITORIALS

An Accusation That Does Not Asperse

REBUKING our friends in the press is never a pleasant task, especially when the journal is so reputable and well conducted an organ as the New York Evening Sun. Yet something should be said as to the unfair comment it allowed its correspondent to make on J. B. Neale's testimony in Washington, and as to the heading it permitted a headline writer to put on the story. The headline runs, "Coal Barons Dictate Price; Admit They Kept Surplus Out of Market," and the news item runs as follows:

"Something of the methods used by the anthracite operators of the country to prevent surplus production of the product and thereby prevent decreases in prices was related to the Senate Sub-Committee on Manufactures today. J. B. Neale, Director of Anthracite Production for the Fuel Administration, and himself a millionaire anthracite producer, was on the stand. Answering questions of Senator Reed of Missouri, he contended that before the period of Government supervision anthracite operators were always able to meet the demands of the country.

"'But there never was a surplus of anthracite,' Senator Reed remarked. "There never was a surplus put on the market,' Mr. Neale corrected. 'This was done in order to keep up the prices,' asserted Senator Reed. The witness did not deny this."

The implication is that when a surplus output exists the failure to sell coal at any price, high or low, which can be obtained evidences a criminal conspiracy against the public. But is this conclusion fair? Is it not a fact that most papers sell on the stands everywhere and always at two cents a copy-no more, no less? Is it not also a fact that the newspaper publishers aim to restrict the output so that there will not be a surplus? Could it not also be proved that owing to that imperfect balancing of supply and demand to which newspaper vending is always subjected there is often a surplus of copies of these papers? What is done with the papers thus in surplus? Are they sold to the public at any price they will bring? Not at all; the price is kept at two cents uncompromisingly, and if the papers are not sold the output is deliberately destroyed.

The larger anthracite operators do not follow the journalistic detractors of the coal industry in their ruthless destruction of such property as is unsalable at the determined price. What they cannot get a fair price for they store and sell as soon as they can. Some of the small operators sell below that fair price, for they desire to keep their men working and meet their overhead; and some perhaps can afford to sell a little under the market. Any newspaper could also afford to sell its overplus under its market rate of two cents. Some could uniformly sell for less. But none of them do so. No one has yet condemned them, and why should we? But let their correspondents be more truthfully considerate of the

position of the operators, for their own is, if anything, less honorable. For this reason let them exercise a genial censorship over their pages. The right of a man to ask a fair price and to insist upon it should not be questioned. If the price is not fair, that is a horse of a different color, as the correspondent we have quoted at length should, and is, doubtless able to observe.

It is interesting to note how curiously the public holds to two contrary doctrines—that of the fair price and that of unrestricted competition. The people believe they are always entitled to the lower price, whichever that may be. If competition has for years beggared an industry-and history records the time when the anthracite industry was so beggared-nevertheless nothing higher than a "fair price" must ever be put on the coal. As soon as competition reasserts itself the price must be allowed to fall to the lowest of levels without any resort to storage. Either the fair price or the competitive price should be the price set on an ar-Those who call for the lower of the two require that the industry shalf go on half rations, or no rations much of the time, and content itself with merely a lifesustaining meal on those rare occasions when unbounded prosperity furnishes the opportunity.

Abjure the Word "Not"

ACARTOON entitled "Early at the Garden Gate Was Late Paying for Liberty Bonds," which appeared recently in the pages of this publication, was exhibited to a friend who at one time had been an advertising man. The story it told seemed perhaps a little involved, and a criticism of that feature was fully expected. But to him that fault did not appear so large as it did to others.

The cartoon seemed to him to be badly conceived because, as he expressed it, it was "negative." It showed someone doing what he ought not to do. Our critic would rather have had it exhibit the man doing something that he ought to do, that it might stimulate others to do likewise. The man in the office saying "Nothing doing," grated on our friend's advertising sense and "The reply you are seeking," he said, "is training. 'Yes' and not 'No,' so why show a man resisting your You oppose yourself by the very nature of your communication. You arouse the very impulses which you wish to combat. You say to the man whom you address that his ideas are repugnant to those you entertain, and you have him battling at once against your point of view. Get 'Yes' into the air he breathes. Make compliance the natural course, and the work is half done."

This man was only indirectly interested in the coal industry. It is to be hoped therefore that he had not read many of the editorials that have appeared in *Coal Age* and counted just how often the negative side was taken when the positive would have been more helpful

and uplifting. If we will, all of us—operators, managers or editors—can rip out the "nots" and by a little reconstruction of our sentences express the same ideas just as clearly and forcefully without them. Let us abjure that short and savage adverbial particle "not."

There is a positive way of doing most things. Let the negative way come as a little-used expedient, as something that surprises us and the world around us, and not as the regular order of life, as it is too often with all of us today.

Greater Efficiency or Lower Wages?

REALIZING that the United States is the home of the high wage and the short working day, and therefore is handicapped when it enters into competition with foreign countries, there never have been voices wanting in the country to plead for wage reductions and longer hours. Somehow we have kept going with bigger wages and a shorter day. The source of our success has been largely in the superior intelligence and progressiveness of higher-paid and less-fatigued labor.

In efficiency lies our national strength. We have always had it, and it is to be hoped we always will. It is partly due to the physical condition of our workers, the outcome of fair wages and good living conditions. It arises partly from the intellectual quality of our artisans, the result of our common school education and of the freedom of thought which we have encouraged. It comes also in part from the good will existing between the worker and the planner, between the enterprising followers and the still more enterprising leaders in industry.

It has its origin partly in the fact that our men are in a degree the natural selection from foreign countries, the most aggressive, most physically able, the most hardy that Europe has afforded. We have for years drained Europe of its energy. Was there a man who had force in his arm, original impulses in his brain and idealism in his soul, he tended to come where all these things would have wider play—in a new field where they were likely to be less confined. As the Westerner is larger in body, broader in mind and more widely visioned than the Easterner, so in a way have we of America seen our problems and met them somewhat more originally than the people of Europe.

In 1917 the British coal mines produced only 243 tons per person, despite all the prodding which came from patriotism and necessity. It is true there were probably quite a few women among those persons, and with all regard for the fair sex most of them are not equal to men in performing the tasks around the mines. Perhaps we are not justified, therefore, in comparing "persons," male and female, with mine workers who are all males.

With this proviso we pass to the question of what we, in the United States, are doing. That is hard to determine, but Dr. Garfield, judging by the progress during the months preceding the close of the war, figured we would produce in a single year 600,000,000 tons of bituminous coal and 100,000,000 tons of anthracite. The war being over, we may not reach these stupendous figures; but if we do, seeing we have 720,000 mine workers, the average output will be nearly 1000 tons per man. The tonnage produced by each miner will be

therefore between three and four times as much as that of the British operative. We probably have a few advantages in the physical conditions of our mines, and doubtless we secure part of our tonnage by being, on the whole, more wasteful of our coal; but the difference in production is remarkable in view of the fact that the coal mines of the United States are as wasteful of labor as they are of coal. The lack of coördination in the average American mine is deplorable. Men are continually waiting for cars, and the use of mechanical aids could easily be extended if only the basis of pay were such as to furnish the desired incentive to the operator. With a fixed scale per ton of output, the operator has no incentive to provide every known mechanical aid to production or to furnish the operative with effectual support.

But even with things as they are, why fear the competition of the foreigner? and why reduce wages? The man who produces three or four tonnages is entitled to better wages than the man who produces one tonnage, and such a wage can be secured to him. The only fear that we might well have is that having this splendid manhood we spoil it by forgetting how it has been obtained; how, having been obtained, it has been bettered. Let us avoid souring the laboring man by scolding him and meditating a wage reduction. He has done well, is doing well, and is going to do well if those who are undertaking his ordering and directing will see him as he is and not magnify his shortcomings, of which he has less than any workingman in any other clime or country.

Sewer Pipe for Water Lines

A GOOD way in hilly country to supply water for boilers and compressed-air engine intercoolers is by impounding water in little branch runs and directing it toward a large reservoir by sewer-pipe lines run on an extremely easy slope, following the contour lines more or less closely.

As a rule, for lack of capacity, only a part of the runoff that comes from a storm can be impounded in the reservoirs at any mining plant. But the water that is caught and rendered available during a dry spell can all be so saved. The sewer pipes, therefore, need not be large. They should be of such size as to carry satisfactorily the dry-water flows of the streams that they tap—always presupposing that taking that flow and redirecting it does not violate any riparian rights.

It might be well to block these pipes when the water is not needed, so that when the water is high and muddy they will not function and so block up. When the water is low and therefore clean, the mouths of the pipes can be opened and full use of their capacity can be made. "Sewer" lines should always be made tight and properly laid with full joints. If water can escape from the pipe, it is sure to leave the silt behind it and cause trouble.

It is a strange thing how generally the mining profession believes the sewer pipe to be a device in which only sanitary engineers are interested. There are many places where sewer pipe can be laid with advantage, but unless they are well and truly laid they will occasion trouble. There is too great an inclination among municipal, as among mining engineers, to slight the problems presented by sewer-pipe laying.

On Your Work Their Health Depends



When hard coal was rationed, New York and Philadelphia were left to the last. As they were near the anthracite field, it was expected that it would be easy to rush coal to them at any time. But influenza and patriotic celebrations have reduced the output immensely, and these good cities with their men, women and children are now, and expect to be later, extremely short of fuel. They appeal to the miner to do his best to reduce their suffering as much as possible.

DISCUSSION BY READERS

Hindrances to Coal Production

Letter No. 7—Being the secretary of the coal production committee at our mine, I am in a position to know what is the chief hindrance here to the mining of coal today. Frequent reference has been made in Coal Age to the booze habit of coal miners, and this I believe to be the one great cause that prevents our mines from being worked to their full capacity.

While I do not believe that coal miners as a class are intemperate, it must be acknowledged that some of our best miners drink and continue to imbibe as long as their money lasts. The result is that they get drunk and, for days, are incapacitated for work. When, finally, they do return to the mine they are in such a sad condition as to be wholly unfit either for business of for social duties.

Let me say, here, that I feel proud of the record that has been made at our mine, notwithstanding the fact that the influenza almost knocked us out, three of our men dying and thirty being off at one time. I am glad to say, however, that we are now coming out from under the influence of this terrible malady. Our men are coming back to work, weak and pale, but eager to get busy again and anxious to do their best in helping to solve the great problems following the war.

The influenza epidemic was one of those unavoidable causes with which we must occasionally contend; but it is one that comes and goes and not like the booze habit, which comes and stays. Booze among miners is therefore a worse evil and more difficult to overcome.

THE SHAME OF DEALING LIQUOR OVER A BAR

Speaking of intemperance, it is a shame that any individual who wants to be classed as a man will stand behind a bar and sell booze to a coal miner who he knows will get drunk and be unfit for work the next day. The small profit that comes to the hotel man is no compensation for the harm done to the coal industry by making the man drunk.

Let us say that the bar makes a profit of \$2 a day from a miner who spends \$5 out of his income of \$8 or \$10 a day. The transaction not only means a loss to the man and to his family, amounting to \$12 or \$15 or more in his pay, but a loss to the Government of eight or ten tons of coal every day the miner is out of his place. It seems strange that this hindrance to the production of coal and loss both to the Government and the individual miner should be permitted for the small profit of \$2 a day to the booze man.

One of our men who has been on a spree for three weeks at a time tells me that his system, plan or method—call it what you may—has been the following: He would go to the hotel early in the morning, drink as much as he felt he could get home with, and then buy an extra quart to take home, as landlords in our country are not allowed to sell liquor in bottles. At home, he

would drink the other quart and the next morning would find him again at the hotel. He would go through the same performance, day after day, till all his money was gone, when he would sober up and return to his work in the mine.

Let me ask if there is a Hun who, fighting against our boys "Over There," has hurt our cause as much as the man who deals out booze to the coal miner? Has not the time come for us to question the patriotism of such a dealer? I regret to say that it has recently been my duty to report five of our men for being intoxicated from one to three weeks at a time.

But, the mining of coal is not the only industry that is hindered by the booze habit of its workers. All employers of men are handicapped by reason of the same cause. We have been fighting the Hun abroad, for the sake of democracy and to make the world a safer place for living, which is surely a grand purpose; but how about the "Hun" at home? Should we not be consistent and strive equally to make our camps, boroughs, cities, county, state and country also safe for living?

Osceola Mills, Penn. S. D. HAINLEY.

Reversing an Electric Motor

Letter No. 1—Referring to the inquiry and the reply to the same, which appeared in Coal Age, Nov. 7, p. 878, regarding the question of reversing an electric motor, permit me to offer the following suggestions with a view to eliciting further information:

As the inquiry does not state the cause of the reversal of the current in the circuit, or how it became known that the polarity had been reversed, it is difficult to say much by way of explanation of such a fact. It is possible to reverse the magnetism of a dynamo field by an accidental short circuit between the external leads of the machine and the circuit supplied by another machine.

EARLY EXPERIENCES IN ELECTRICAL PRACTICE

In earlier days when, because of the limitations of electric-power plants for street service use, alternating current could not be used to advantage for that purpose, and, it was necessary to transform the current by means of a small series-wound, direct-current dynamo equipped with a regulator. It frequently happened that this machine would become grounded on the circuit of another machine, causing a residual magnetism of the field pieces. The dynamo would then build up in the wrong direction; or, as we would say, "upsidedown."

It seems strange to me that a machine, which I assume was compound-wound, should become entirely reversed. It is possible that the wiring in the power house had been altered and the positive wire changed to the negative terminal. In any event, however, the

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circuit is said to have been reversed and the question is, What effect such reversal would have on the motor in the mine. As stated in the reply to this inquiry, the reversal of the current in the circuit would not reverse the motor, which would continue to rotate in the same direction as before.

ELECTRIC MOTORS DIFFER FROM DYNAMOS IN NOT BEING SELF-EXCITED

It may be remarked, here, that all commercial types of motors used in mines are equipped with electric magnetic fields, which are excited from the main circuit. For that reason, residual magnetism is not required to build up a magnetic field to be cut by the armature, as in a dynamo, which is self-excited.

The current flowing through the field winding of the motor, in the case in question, would at once set up a magnetism in the opposite direction to that produced before reversal of the main circuit took place. Then, as has been explained, the armature circuit being also reversed, the direction of rotation of the motor would remain unchanged.

To my mind, I can see no trouble that could have occurred, unless it was caused by an attempt to parallel the reversed machine with one operating in the usual direction. The only effect of the reversed current would be probable damage to the switchboard instruments, owing to the current passing through them in the opposite direction.

W. J. GRAHAM,

Camp Jackson, S. C. Electric Maintenance.

Iron vs. Wood Mine Cars

Letter No. 5—I have read with much interest the remarks of John T. Cox, on the question of the use of iron and wood cars in coal-mining practice, Coal Age, Oct. 24, p. 793. Perhaps, there is no better way to discuss the merits of the steel car, as compared with the wood car, than to take Mr. Cox's letter, conceding, of course, that he has had considerable experience in the operation of coal mines and gives, in his letter, the results of that experience. My own experience with the steel and wood mine cars differs from his, however.

In the first place, the question of low or high coal, in my opinion can have no bearing on the type of construction of a mine car. At least, it has never occurred to me that the thickness of the seam enters seriously into this question; and my experience has been gained in different mines where the thickness of the coal has varied from twenty inches to thirty feet.

FLEXIBILITY VS. RIGIDITY IN MINE CARS

Again, speaking of the flexibility of the wooden car in contrast with the rigidity of the steel car, it seems to me that this question cannot be discussed in an intelligent way without knowing something of the design of the car or its construction. I may say, however, that the wood car has been much more liable to keep the track than the more rigid iron car. Often, while going around the mines, I have seen cars or trips derailed, and when inquiring as to the cause have been told that it was the new cars which were too stiff and rigid. My personal opinion is that new cars have been responsible more than once for such derailments owing to their rigidity. I make this statement to show, if possible,

that rigidity in the construction of a mine car is of no particular advantage, but rather detrimental to the efficiency of the equipment.

Mr. Cox refers to the necessity of inspecting the wood car more frequently. Although believing that this is a debatable question, I still contend that mine cars, whether built of wood or steel, should be inspected with equal care and sent to the shop for any slight repairs whenever necessary. I may also state that the mine cars of most coal mines get far less attention than they should, by the men in charge of the mines.

The question of dust-proof cars is one of considerable importance in the soft or bituminous mines of the country. I will, therefore, not argue that point further than to say that wood cars can be made dust-proof as well as iron cars. Also, in regard to replacing derailed cars, I agree with Mr. Cox that it is easier to replace a rigid car on the track, in a thin vein, than to do the same with a loose, flexible car, whether it be built of wood or steel.

CONDITIONS AFFECTING CHOICE OF MATERIAL

The question of which kind of car will require the greatest amount of repair and attention is of the most importance, and should be one of the controlling factors in deciding the question of what material the mine cars should be constructed. The conditions that affect the choice and which should be considered, before one finally decides the matter, are the following: (1) Size and capacity of the car; (2) style of construction; (3) the conditions under which the car must operate; (4) the dip or pitch of the seam; (5) kind of haulage employed; (6) amount of water encountered in the workings and its corrosive effect. An experience of several years in the anthracite mines of Pennsylvania leads me to say that the steel car is not adapted to the mines of this field.

Allow me to cite a few instances, here, that have come under my personal observation, and give my reasons why steel or iron cars are not adaptable for use in *all* anthracite mines, at least.

STEEL CARS IN ANTHRACITE MINES

As already stated, one of the items that must be considered is the capacity of the car. If the car is to carry say three tons of coal, which is frequently the case, the construction of the car must be considered. Such a car built of iron will be much heavier, in proportion to its capacity, than a wooden car of the same cubical contents. If the vein or seam has a dip of, say ten degrees, that item alone will be one of considerable importance, as a heavy car will be handled with some difficulty if the hauling is to be done by mules.

The effect of acid mine water on steel cars is of much importance. During the past fifteen or twenty years some of the large coal-mining companies operating in this field have experimented considerably with this portion of their equipment.

The Susquehanna Coal Co., having collieries at Nanticoke, Penn., purchased a large number of steel cars, for use in their Stearns shaft, and my impression, now, is that these cars did not fulfill expectations. My recollection is that the bumpers or frame were found to be the weakest part of the car. The design was, then, changed to that of part steel and part wood, the

frame or sills being of wood, while the body was of steel and was bolted to the wooden truck. Although this did not give wholly satisfactory results, it proved much better than the all steel car.

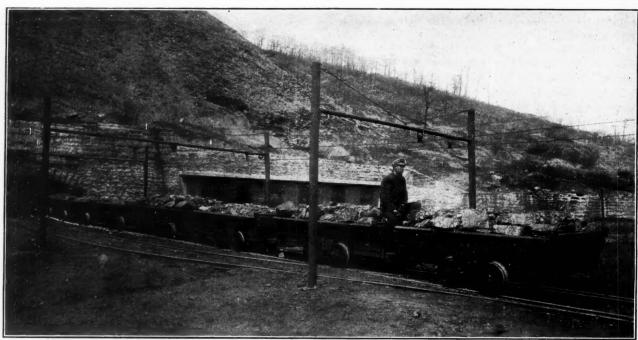
The coal-mining department of the Delaware, Lackawanna & Western Railroad Co., a few years ago, decided to try out some steel cars, at several of their collieries in the Lackawanna and Wyoming coal fields. The results, in nearly all of these cases, were unsatisfactory, however, particularly where the mine water was strongly charged with destructive acids, which was the case in many of the mines.

From my experience in the mines of the anthracite region, I very much favor the use of a wood mine car. The suggestion that steel mine cars are worth something for scrap must, in my opinion, be considered from

The mine foreman at the Cresson colliery, in reply to my question regarding the quality of these cars, exclaimed, "Good service? Fine service! I wish, to goodness, that all my cars were of that class."

In deciding on the type of mine car to be adopted when equipping a large mine, one must use every precaution; and this led me, before leaving the place, to seek out the assistant superintendent, whose views I knew were always expressed with great candor. In reply to my inquiry asking what he thought of the use of iron cars as compared with wood cars, in mining practice, he exclaimed, "They are the real thing, those cars."

To show the style of iron car in use at the Ehrenfeld mine, I am sending a photograph of a portion of a trip standing on the track at the mine entrance. These



TRIP OF STEEL CARS, AT THE EHRENFELD MINE, WHICH IS WORKING A 42-IN. SEAM OF COAL

more than one angle. I have a case in mind, now, where a trip of eight cars ran away on a plane and was badly wrecked. The cost of cleaning up this wreck and removing the damaged cars to the surface and the delay occasioned thereby convinced me that a steel mine car was a misfit in the coal mines of this valley.

Kingston, Penn. AJAY.

Letter No. 6—In connection with the interesting discussion regarding the relative advantages to be derived from the use of iron or wood cars, in coal mining practice, allow me to submit the following as showing the high regard that users of steel cars have for that type of equipment. It is my belief that facts speak louder than words that merely express an opinion.

At the Ehrenfeld No. 8 mine of the Pennsylvania Coal and Coke Corporation, in Cambria County, there are 700 mine cars in use today. These are built of "Armco" iron, and to say that the cars give satisfaction but half expresses the high regard in which they are held by every mine official about the plant. Speaking of their service in the mine, everyone uses the most flattering terms.

cars were manufactured by the American Rolling Mill Co., Middletown, Ohio. The illustration shows the general form or style of construction of the car used in the Ehrenfeld mine where the seam has an average thickness of only 42 in. The height of the car is reduced and its length increased to conform with the conditions in this seam. The car was built with flaring sides and an end gate and has a capacity of about 2 tons. I offer this as an interesting presentation in favor of the use of iron mine cars in coal mining.

Justice to the Miner

PROGRESSIVE.

Letter No. 8—The cry heard on every hand today is "cleaner coal and more of it." The man who descends into the bowels of the earth has had it put up to him squarely that he must strive for a greater production of coal. The public, which is not familiar with actual mining conditions, has not been slow to cast reflections on the miner because he does not come across with a certain tonnage every day. The miner is accused either of being intoxicated, a casual worker or even a "slacker."

At times it has even been intimated that mine officials were not making the efforts they should to increase the output at their mines.

The honest miner feels the injustice of these charges, and I want to say that we who work underground are just as patriotic as men who are employed in other industries. Unlike these men, however, we are working under conditions that at times render us helpless to do all that we would like to do.

Coal mining today cannot be compared with coal mining of a few years ago. The anthracite mines have been noted for their high coal. In some instances the seam would reach a height of 20 or 30 ft. Moreover, the coal was of such a nature that it did not require much more than ordinary skill and effort on the part of the miner to produce a large tonnage. In the early days of coal mining, work was almost wholly confined to these large seams, where men established a record that cannot be equalled in present-day mining. It is much to be regretted that these big coal seams were sought after and mined exclusively in former days, while the smaller seams were left to be mined now when the cry is "coal, and more coal." Had men been content to work the small seams as well as the larger seams, there would not be the difficulty of finding coal today sufficient to meet the demands.

CONTRASTING CONDITIONS IN HIGH ANTHRACITE SEAMS WITH THOSE IN LOW COAL

Contrast for a moment the work in a seam of coal 15 ft. high, and having little refuse, where miners have averaged from 30 to 100 cars to a single keg of powder. In such seams there was plenty of headroom on the roads, which required no brushing of the roof or lifting of the bottom in order for the cars to follow the men in their advance. The miner suffered no inconvenience in moving about in his room, where he could stand upright.

Compare this condition with work in a 3-ft. or a 5-ft. seam, having from 6 to 12 in. of refuse that must be separated from the coal before it is loaded. Under such conditions is it to be wondered at that a miner cannot get out more than five or seven cars to the keg of powder. Consider, also, that in order for the cars to follow the men it is necessary to brush the roof or lift bottom varying from 12 in. to 3 ft. in depth. When one considers these facts it is clear that the miner is working under different conditions today.

MAN POWER IN COAL MINING, TODAY

Men who profited by mining the high seams in former days would today find themselves confronted with a different proposition. Not only are the difficulties of mining increased, but there is a different class of men to be handled in the mines; and the situation is made worse by the fact that the opportunities offered by other industries have drawn away many of the best miners, which has greatly reduced the capacity of our mines. The sooner something is done to conserve the man power in mining and to induce good miners to stick to their work in the mines the better it will be for all concerned.

In the anthracite field there are acres upon acres of small seams that are still to be worked. The question

is, where can we get the men to work them? Men are loath to work in these seams because they want to do their bit and measure up to the men working in other seams under more favorable conditions. To do this means that they would have to exert themselves to such an extent that they would not hold out for long, and so they seek work requiring less labor.

What is needed today, in the opinion of good mining men, is better equipment and such as will be adapted to present mining conditions. Face coveyors are needed in low seams. The height of the car must be reduced a few inches. Electric or compressed-air motors must be installed and everything possible must be done to reduce the labor required in the mining of these low seams.

DEADWORK IMPEDES A MINER'S DAILY TONNAGE

Only a few weeks ago I watched with interest a district where 25 men were working single-handed. The first day they loaded 75 cars of coal, the second day 60 cars, the third day 55 cars, the fourth 50 cars, the fifth 63 cars, and the sixth and last day of the week 56 cars, making a total of 359 cars of coal loaded by 25 men in six days, which is an average of less than 2½ cars per man per day. The average, in this district, would be three cars per man per day, and the reason this was not realized in the case I mention was the fact that the men had to work lifting bottoms much of the time, in order to get the cars to the face of the coal where they were loaded. An average of three cars per man per day would have produced, in this mine, 450 cars a week, which shows a loss of 450 - 359 = 91 cars of coal, or practically 20 per cent.

Let me urge, in closing, that the introduction of mechanical devices to lessen labor and maintain a fair average tonnage per man per day will greatly increase the production and lower the cost. The first outlay would be the greatest; the cost of maintenance would be small as compared with lifting bottoms, laying track and cleaning the coal, as the miner would not then get the rock mixed in with his coal. To just the extent that operators give their attention to installing suitable mechanical devices will they realize better results in their mines.

L. R. Thomas, Section Foreman,

Edwardsville, Penn. Woodward Mine.

Perplexities of Mine Foremen

Letter No. 4—No doubt every mine foreman has troubles of his own; but is it not true that many foremen make much of their difficulties and perplexities? This thought suggested itself to me when reading the letter of a mine foreman, which appeared in Coal Age, Oct. 24, p. 793, and in which he described the difficulties growing out of a condition, in a miner's place, where the machineman had to leave a thin layer of coal at the bottom, in order to avoid striking a roll at the other end of the cut.

The simple manner in which the superintendent, later, adjusted the matter led me to think that if the mine foreman had exercised an equal amount of tact and had foreseen the trouble that would arise if the matter got out of his hands, he would have avoided the snare into which he fell.

A mine foreman must deal with all classes of men, many of whom are indifferent to the needs of our country. There are men who would sleep if their house was afire, and there are miners who, when patriotism is mentioned and their need of getting out more coal is urged, will cause a diversion, by some remark that starts the laugh so that, for a time, the getting out of coal and patriotism are forgotten. The mine foreman who is on his job is well acquainted with that kind of a chap, and loses no time in giving him a hint to get busy at once.

DIFFICULT PROBLEM CONFRONTING FOREMEN

A machinerunner is told to waste no time in getting his machine going, as men are waiting for their coal to be cut. Does he give heed to this gentle reminder and proceed at once to hasten his work? No! Too often it happens that the machineman is independent, knowing that competent men are scarce and that his job is safe. The question arises, What is the mine foreman to do under such circumstances; can he induce or compel men to continue to work when they want to quit?

Let me illustrate: In our mine there is a full crew of haulers, timbermen, roadmen and miners, who enter the mine in the morning ready for a full eight-hour day. The coal digger or loader starts to load his car; the machinerunner gets busy cutting the coal in the miners' places and the work goes on for five or six hours when a loader is seen going home. You ask him why he is going out so early. His reply is that he has loaded all the coal cut in his place.

A little further up the entry you come across a machinerunner making his way out of the mine. In answer to your anxious inquiries, he informs you that he is "tired and played out." You suggest that he "rest a bit and come back," to which he replies that he has had "plenty for one day."

The next day diggers are waiting for their coal to be cut; everything moves slow in the mine and the day's run falls far short of the average. The foreman is perplexed; yes, "perplexed" does not express his mental condition. He is at a loss to know what he can do to get his men to work the full day.

MINE FOREMEN AND THE "SQUARE DEAL"

In the letter to which I have referred, mention was made of the impossibility of a mine foreman getting a "square deal;" but he is not the only one to whom that will apply. When the machinerunner will not cut the coal, it is the miner who fails to get a square deal and must lose his day's work. It would only be justice to charge the machinerunner with the miner's loss of time when that is due to the former's neglect or unwillingness to work his full day.

It seems to me that there is but one remedy to apply to regulate these conditions, and that is to place the coal mines under martial law or operate them after the manner that controls the building of our ships. Many mine foremen and superintendents would welcome the authority that would keep mine workers in their places and compel them to perform their whole duties. Imagine, for a moment, what would be the result if coal mines were operated today on the same plan as shipyards

where the workers cannot choose the number of hours they shall work. What interest can men have in the country's needs when they work five, six or sometimes seven hours out of the twenty-four. This kind of slackerism is far too manifest in the various branches of coal mining and, in my opinion, it can only be overcome by martial control.

While on this subject, let me mention the difficulty that surrounds a mine foreman having charge of from 250 to 300 men, scarcely 8 per cent. of whom can speak the English language and, perhaps, 15 or 20 per cent. additional barely understand the instructions given them, while the remainder require to be guided finger and thumb, in order to insure their safety, from the time they enter the mine until they reach the surface again.

TWO CLASSES OF FOREIGN MINERS

We can divide the foreign-speaking miners into two classes: First, there is the foreigner who has been in this country six or seven years and worked in the coal mines for the same period. He cannot understand what is said to him, particularly if he desires not to understand.

Second, there is the foreigner who has been in this country from 10 to 20 years, without learning to talk any English. Many of this class appear to be more susceptible to instruction and, yet, like those in the first class, it is easy for them to fail to understand when they wish.

In control of both of these classes, there is generally one or more of their kin who are cute and cunning in their methods. These understand full well what is required, and have it in their power to regulate the output of the mine often with greater skill than the foreman himself. Because of this ability such are able to lead others of their flock in any way they desire, which puts the output of the mine largely in their control and adds greatly to the foreman's difficulties.

FOREIGN MINERS SHOULD LEARN ENGLISH

My suggestion, in this regard, may seem drastic. It is that the foreigner should be given a reasonable time to learn sufficient English to understand the instructions given him in the mine and after that should be compelled to make his wants known in English. As far as practicable, the speaking of a foreign language underground should be forbidden. The children in the schools should be urged by their teachers to talk English to their parents and older brothers who work in the mine.

It is my belief that the failure to learn to understand and speak English after a reasonable time should exclude a foreigner from the mine. This seems all the more important when one considers the seeming failure of attempts to bring foreign miners to know and obey the mining laws and regulations. These have been printed in the various languages and distributed through the mines. But, when a foreigner is caught violating one of the rules or laws, he feigns not to have understood that he was doing anything wrong. Therefore, it would seem that the prohibition of the use of the foreign tongue, in coal mining, is necessary to insure the safe operation of the mine.

Perryopolis, Penn.

R. W. LIGHTBURN.

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INQUIRIES OF GENERAL INTEREST

Centrifugal Mine Pumps

Kindly answer the following questions regarding centrifugal mine pumps: (1) Is there any advantage in having either the suction or discharge pipes larger than what is called for on a centrifugal pump, and would such a larger size of discharge pipe prove any disadvantage in the operation of the pump? (2) What is the effect of a greater or lesser head than that for which a centrifugal pump is designed? (3) Is a long suction, say 500 ft., any particular disadvantage?

Pittsburgh, Penn.

SUPERINTENDENT.

1. In replying to this question, it is necessary to understand what is meant by the size of discharge pipe "called for." We assume that our correspondent has reference to the size of the discharge portal of the pump as calling for the size of discharge pipe required. If that is the case, he is wrong in assuming that the diameter of the discharge portal calls for an equal diameter of the discharge pipe. The fact is the size of a discharge portal of a centrifugal pump is always less than the required diameter of the discharge pipe. As has been explained in Coal Age, Vol. 7, p. 263, the ratio of the diameter of the discharge pipe to that of the portal is independent of the quantity of water discharged and varies directly as the fourth root of the discharge head against which the pump operates. A convenient rule, in practice, is to make the ratio of the diameter of the pipe to that of the portal equal to 4/9 of the fourth root of the head expressed in feet.

For example, assume a No. 9, double suction, volute pump discharging against a head of 256 ft. The number of the pump is commonly taken as equal to the diameter of the discharge portal expressed in inches. Thus, the diameter of the discharge portal of a No. 9 pump would be 9 in. In that case, the ratio of the diameter of the discharge pipe to that of the discharge portal is $4/9 \sqrt[4]{256} = 4/9 \times 4 = 16/9$, and the diameter of the discharge pipe is, therefore, $16/9 \times 9 = 16$ in.

These remarks are based on an assumed perfection in the design of a double-suction, volute pump in which the tip velocity of the revolving vane approaches more or less closely to the velocity head of the water in the volute space surrounding the vane. This velocity is very high as compared with that permissible in the discharge pipe. While the theoretical velocity for a head of 100 ft. is practically 80 ft. per sec. (4800 ft. per min.), the flow in the discharge pipe should not exceed 6 or 8 ft. per sec., in order to keep the losses due to friction at a minimum.

2. Where a double-suction, volute pump is operating chiefly against frictional resistance, and there are few sharp bends or other obstructions to the flow, it can be assumed that the quantity of water discharged will vary approximately with the square root of the head. This,

however, is only a general statement, and the effect of an increased or decreased head must be determined, in any case, by the characteristic curve of the pump, as furnished by the manufacturer.

3. A great length of suction is always a disadvantage, owing to the increased frictional resistance, which adds greatly to the suction head and increases the total head under which the pump must operate.

Hoisting Shaft Problems

We have sunk a shaft 130 ft. in depth, measured from the surface to the bottom of the coal. Kindly state what size of coal pillar should be left for the proper protection of the shaft. The coal is 6 ft. thick. Also estimating on hoisting a total load of 4 tons, including the weight of the cage, car and coal, what horsepower of engine will be required for the work in this shaft?

Corning, Ohio. MINE ENGINEER.

Numerous rules are given for determining the diameter of the shaft pillar required for the protection of a shaft. Most of these are based only on the depth of the shaft. The rule giving the least value for the diameter of a circular pillar or side of a square pillar is that of Merivale, which makes this dimension (d), in yards, equal to 22 times the square root of the depth (D) of the shaft, in feet, divided by 300, giving in this case,

$$d=22\sqrt{\frac{\overline{D}}{300}}=22\sqrt{\frac{130}{300}}=14_{\frac{1}{2}} \ {
m yd.} \ {
m or} \ 43_{\frac{1}{2}} \ {
m ft.}$$

The rule giving the greatest value for the same dimension is that of Hughes, which requires 1 yd. for each yard of depth, making the value of the required dimension, in this case, 130 feet.

A rule that gives better and more uniform results makes the value of the required dimension (d) three times the square root of the product of the depth (D) of the shaft and the thickness (t) of the seam, all expressed in feet, giving in this case,

$$d = 3\sqrt{Dt} = 3\sqrt{130 \times 6} =$$
say 84 ft.

In calculating the horsepower required for any given hoist, it is customary to add one-third to the total load hoisted, to allow for friction, etc. This increased load is then multiplied by the speed of winding (ft. per min.) and the product divided by 33,000, which will give the effective horsepower. This result must then be divided by the efficiency of the engine, which may be estimated as 85 per cent. for an ordinary slide-valve, noncondensing engine.

Assuming, in this case, a speed of hoisting of, say 15 ft. per sec. (900 ft. per min.), gives for the required horse-power of the engine.

$$H = \frac{4/3(4 \times 2000)900}{0.85 \times 33,000} = 342 + hp.$$

EXAMINATION QUESTIONS

Mine Examiners' Examination Springfield, Ill., 1918

(Selected Questions)

Ques.—What are the duties of a mine examiner? Ans.—The coal-mining laws of Illinois (Sec. 21) specify the following: (1) To examine the underground workings of the mine within 8 hours of the time when the men enter for work, or less if required by the mine inspector. (2) The mine examiner must carry a safety lamp that is in good condition and a rod or bar for sounding the roof. (3) He must ascertain that the air current is traveling in its proper course and that a sufficient volume of air is in circulation. He must measure the air passing in the last crosscut of each pair of entries, or the last room of each division in a longwall mine, and elsewhere if necessary, and must make note of these measurements in a book kept for that purpose. (4) The examiner must inspect all places where men are required to pass to and fro or to work and make note of any dangerous roof or accumulation of gas or obstructions of any kind in the rooms or airways. He must examine the edges and all accessible parts of falls and old gobs and aircourses to see that they are clear of gas. (5) The examiner must mark on the walls of each place, not on the face of the coal, the date of his examination. (6) He must place a conspicuous danger signal at the entrance of each place found to be dangerous, and place at least two obstructions, not less than 20 ft. apart, across the roadway leading to a room or heading where gas has been found, one of which must be outside the last open crosscut. (7) He must make a daily record of each examination, in a book kept for that purpose, before permitting the men to enter the mine for work. (8) The mine examiner must take possession of all entrance checks of men whose working places he has found to be dangerous, and deliver these checks to the mine manager (foreman), whose duty it will be to hold back the men from proceeding to their work.

Ques.—When do you consider the quantity of air entering the downcast shaft sufficient for the ventilation of the workings?

Ans.—The quantity of air entering a mine must be sufficient to comply with the requirements of the mining law and satisfy the mine inspector of the district. In addition to this, the total circulation must be sufficient to supply the particular needs in each district of the mine and keep the working faces free from accumulations of gas, assuming that the main current has been divided and the air distributed in proportion to the needs in each section of the mine. The velocity of the air at each working face must be sufficient to dilute, render harmless and sweep away the gases that would otherwise accumulate there or in any void and abandoned places in the mine.

Ques.—What will be the rubbing surface in an airway 3000 yd. long, 6 ft. high and 12 ft. wide?

Ans.—The perimeter of this airway is 2(6 + 12) = 36 ft. The rubbing surface is then found by multiplying this perimeter by the length of the airway, which gives, in this case $36 \times 3000 \times 3 = 324,000$ sq.ft.

Ques.—Name the gases found in the coal mines of this state.

Ans.—The mine gases commonly found in Illinois are the following: Methane or marsh gas (CH_4) , carbon dioxide (CO_2) , carbon monoxide (CO), besides the nitrogen and oxygen of the atmosphere. In addition to these, also, there are sometimes found small quantities of hydrogen sulphide (H_2S) and the hydrocarbon gases, olephiant gas (C_2H_4) and ethane (C_2H_6) , together with traces of hydrogen (H_2) .

Ques.—State how you would make an examination of a coal mine, as mine examiner.

Ans.—Having prepared and carefully examined the safety lamp to be used in making the examination, start in time to complete the work in a thorough manner before the men must enter the mine in the morning. Before going into the mine, however, ascertain that the fan is working properly in the usual manner. Then, proceed at once to the foot of the downcast shaft or the intake airway and observe whether the usual quantity of air is passing into the mine. Having reached the district in charge, enter and examine each working place in order, following the air current from place to place, making a special test for gas in each place and examining the roof and coal to ascertain that they are in a safe condition for work. In each place examined, mark the date on the wall, as evidence of your visit.

In this manner, proceed throughout the district, examining not only the working face in each room and heading; but, also, the edges of all falls and the accessible parts of abandoned workings. Having completed the rounds, make a full record of the examination in the book kept for that purpose, noting those places where danger of any kind has been found and explaining its nature. This must be done before permitting the men to enter the mine for work. Finally, the mine examiner must take from the board all checks belonging to miners whose places he has found unsafe for work, and deliver such checks to the mine manager who will not permit the men to enter until their places are made safe for work.

Correction

A typographical error appeared in the answer to the last examination question appearing in $Coal\ Age$, Oct. 31, p. 838. The last lines of the answer given should read, Assuming a stroke of 18 in., the piston speed being 600 ft. per min., this engine must run at a speed of $(600 \times 12) \div 18 = 400$ strokes per minute, or 200 r.p.m.

COAL AND COKE NEWS

Harrisburg, Penn.

Members of the draft boards declare that they had not received any information as to when the many thousands of miners will be returned from the army by the War Department to their pre-war positions. As to the miners being given the priority of discharge from service, the draft boards were inclined to believe that if the Government contemplates such a move they will receive notification. If all return to their former occupations it is expected that it will result in an additional 300,000 tons of coal being mined every month in the hard coal fields, and it is deemed possible that the majority will resume their former task, as at the present time mine workers are receiving the highest wages in the history of the industry.

The coal companies have already placed requisitions with the Federal and State employment bureaus showing the number of men needed to bring the coal production to the maximum set by the Fuel Administration.

An important conference will be held in

to the maximum set by the Fuel Administration.

An important conference will be held in this city during the next two woeks, which will be attended by representatives from both the anthracite and bituminous regions, to prepare to secure an appropriation from the legislature at the coming session to make the Susquehanna River navigable, so as to secure a better outlet for coal and at the same time to get lower freight rates. One of the leaders of the movement is Major Gray, whose survey made a few years ago revealed that the Susquehanna can be made navigable at a cost much less than that New York expended for the barge canal that extends across New York state.

Uniontown, Penn.

Uniontown, Penn.

Acceptance of coke at the point of shipment rather than at the point of destination, provided in the contracts for coke for the first half year of 1919, mark an entirely new departure in the relations of producers in the Connellsville region with their customers, the blast furnaces. The clause in virtually all the new contracts will make necessary an inspection of all coke at the yards here, and commencing the first of the year many blast-furnace coke inspectors are expected to be assigned permanently to the Connellsville region.

All contracts made for the first half quote the Government fixed price of \$6, but contain provisions making them subject to future price rulings of the Fuel Administration. Should the Fuel Administration be discontinued during the period of the contract, the contracts will be terminated at the last prevailing price of the administration. Although there have been intimations that the Government will shortly relinquish its control of the bituminous coal industry, no such action is expected for the present in the coke industry, which is so closely related with the production of iron and steel.

Although influenza is still responsible in a large measure for the continued reduction of output in the Connellsville fuel field, comparison of last week's output with the high war-time record presents in a fair way what the war-time stimulus did toward increasing production. The production for the week ended Nov. 23 shows a net decrease of 225,663 tons of coal frem the high record of Oct. 12.

How highly the region was geared up to top-notch efficiency under the war demand for fuel is just now being appreciated by fuel administration officials who directed the war-time organization. They believe that throughout the war-time campaign the workers, especially the Slovaks, had a keener appreciation of the importance of their work than they were given credit for. With the war ended there is everywhere a tendency to relax effort, and no program has yet been outlined again to speed up

is of an inferior grade, which may be sold for domestic purposes. Consumers are accepting this inferior coal rather than be forced to close down their plants.

Charleston, W. Va.

Charleston, W. Va.

An ample flow of cars into the Fairmont district has resulted in a material increase in the coal output of that region. The car supply is now being stabilized, as the service all during the week ending Nov. 23 demonstrated. The average run of cars in the district during the period mentioned was in the neighborhood of 1700 cars a good day, late deliveries being in evidence. While most of the coal went to the east, there was promise of heavier western shipments, especially in view of the fact that the Ohio market for byproduct fuel had been opened up.

Labor shortage is still cutting the output of the Tug River and Pocahontas districts to the extent of 47,120 tons a week, the total loss from the last report being 61,000 tons. There has been a slight though not marked tonnage loss from car shortage—about 7000 tons. Weekly production is about 415,000 tons. Weekly production is about 415,000 tons. Weekly production is about 415,000 tons. Coke production has diminished somewhat, though not materially, being 49,000 tons.

The mines of the Logan mining district are showing up a little better than was the case early in November, the last report showing a total production of 207,912 tons as against 186,922 tons for the previous week. The production loss has been reduced from 70,000 to 52,600 tons a week.

No diminution in the demand for coal has been felt in the New River field. The smokeless coal from that district is still in heavy demand, most of it going to New England and tidewater points. Mines in the district experienced a little difficulty again during the week ending Nov. 23 in securing sufficient power for all needs, although coal movement eastward was slower than usual owing to congestion at certain points.

A damper was put on production in the Kanawha region by an embargo which be-

slower than usual owing to congestion at certain points.

A damper was put on production in the Kanawha region by an embargo which began Nov. 18. On Nov. 25 the ban was lifted and coal began flowing again. No district has had a more restricted field in which to sell its coal than the Kanawha district. In justice to the district it is believed the Fuel Administration will modify some of its zone regulations so as to permit Kanawha coal to find its natural outlet, the slight congestion in the district being due to the unduly rigorous zone restrictions.

Birmingham, Ala.

Coal production in Alabama and the Birmingham district is disappointing. For the week ending Nov. 16 only 329,190 tons were mined. There is need for labor in some sections of the Birmingham district, and it is expected that quite a number of men will be available when demobilization begins.

The coke production of the being held being held be a second to be a seco

men will be available when demobilization begins.

The coke production of the district is being held back to some extent by the lagging coal output. Work on 304 byproduct coke ovens in the Birmingham district, 154 at Fairfield, 120 new byproduct coke ovens at the plant of the Sloss-Sheffield Steel and Iron Co. in North Birmingham, and 30 ovens at the new byproduct coke ovens plant of the Birmingham Coke and Byproducts Co. is being rushed. Announcement is made that machinery, material and all appurtenances for these plan's are being gathered for shipment here at an early date, due to the fact that they are more easily obtained now.

The following statement on the situation in the district was obtained from Judge H. C. Sellheimer, Federal manager of production: "Alabama coal interests are likely to permanently lose a good part of the trade they controlled prior to the war unless some means of increasing the output is found. When the Fuel Administration created the zone system last spring it took away a considerable portion of the territory supplied by this district and placed it in other zones. Tennessee and Kentucky

mines were permitted to ship to the Tennessee Valley towns, and Illinois and western Kentucky to the Mississippi Valley. Birmingham district mines have been unable to supply even the restricted territory assigned it and will not be able to do so again until production is considerably increased."

Victoria, B. C.

Victoria, B. C.

The collieries of Vancouver Island during the month of October mined 46,933 tons, an increase of 14,238 tons over the results of the previous month. Despite the loss due to influenza, the production of the Island for October stands the third highest for any month of the year, being only 4099 tons less than the output for March, the record month for 1918, and 1374 tons less than April, which ranks next in order. The Canadian Collieries (D), Ltd., is first with a total of 74,366 tons for the Comox and Wellington collieries, while the Canadian Western Fuel Co. is second with a production of 59,219 tons for the Nanaimo colliery. All the collieries show an increase over the month of September, except the Jingle Pot and the Grant. The tonnages mined by the collieries in the Nicola-Princeton district for the month of October aggregated 15,299 tons, an increase of 468 tons over the September total.

Six sets of the Gibbs oxygen breathing apparatus have been installed by the Department of Mines of British Columbia at the Fernie mine rescue station. These are the first specimens of this apparatus to be introduced into Canada. The Gibbs apparatus was recommended to the Minister of Mines by the chief inspector of mines. George Wilkinson, after investigation, and the former immediately gave the instructions necessary for their purchase and use in this Province. It is practically assured that the Gibbs apparatus will supersede that with which the other mine-rescue stations of British Columbia are equipped as soon as possible. It was thought best to place the first sets received at Fernie because of the Very gasecus condition of the mines of the Crow's Nest Pass Field. It is understood that the Canadian Western Fuel Co. has some of this equipment on order, so that it is probable that the Gibbs soon will be in common use in this part of the Canadian Western Fuel Co. has some of this equipment on order, so that it is probable that the Gibbs soon will be in common use in this part of the Canadian Western Fuel Co

PENNSYLVANIA

Anthracite

Hazleton—The Worthington Pump and Machinery Co. has released several hundred munitions workers. Many of these are former mine workers, and they are seeking their old positions.

Upper Lehigh—The Upper Lehigh Coal Co. suspended operations for the past two weeks, while the machinery of tts old breaker was being transferred to the new breaker building, just completed.

breaker building, just completed.

Tamaqua—A washery erected on the Gerber tract, near here, by the "City of New York," has not yielded that municipality the return expected. An estimated daily output of 15 cars has reached but five cars daily, and that after a long delay.

Sandy Run — Operations at the new breaker of the Upper Lehigh Coal Co. will start about Dec. 1, work on the plant having been completed. The output of the mine will be greatly increased when operations in the breaker begin.

Hazelton—The Lehigh Valley Coal Co.

Hazelton—The Lehigh Valley Coal Co. on Nov. 26 raised the cost of fuel sold to employees. They must now pay the \$1.05 increase allowed the operators by the Fuel Administration, but even at that the scale of prices is about \$1 a ton less than to the general public.

Wilkes-Barre—The Hudson Coal Co. is ready to run the culm bank of the No. 2 colliery through the washery. The larger sizes will be mixed with freshly mined coal and sold to the retail and foreign trade. The bank has been in existence for about 40 years and contains thousands of tons of marketable coal.

Scranton—Owing to illness, it is said that John T. Dempsey. President of District No. 1, U. M. W. of A., in the anthracite region, has relinquished the duties of his office and they are now being performed by John Yanis, of Plymouth, the vice-president of the district organization. From a reliable source it was learned that members of the executive board of the district, in a recent meeting at headquarters, agreed to this plan. in a recent no to this plan.

to this plan.

Hazleton—Lehigh coal field operators face the winter with an immense amount of "dead work" to do to reach the coal. The cream of the coal, easily reached through culm banks, strippings and robbing pillars, has been taken at many colleries, and new tunnels, etc., must be driven to get to portions of the beds hitherto untouched. The new work will entail expenditures that will cul heavily into the reserve funds permitted by the Government under the income tax provisions.

reserve funds permitted by the Government under the income tax provisions.

Mahanoy City — James Mathews, of Shenadoah, was defeated by Chris Golden of Shamokin, for the presidency of District No. 9, United Mine Workers, in the anthracite region. The result was announced at the convention held on Nov. 27. Other officers elected are: vice president, John Strambo, Mahanoy City; secretary-treasurer, John J. McAndrew, Locust Gap; International executive board member, John J. Matts; subdistrict executive board member, George Litwin, New Philadelphia.

Avondale—Officials of the Delaware, Lackawanna & Western R. R., Coal Department, say that the destruction of the Avondale washery, on Nov. 28, will not seriously affect production at the Avondale colliery, as the machinery can be placed in position to resume operations immediately. None of the men employed in the washery will be thrown out of employment, but will be put to work readjusting the machinery and rebuilding the plant. For a time it was feared that the breaker would burn, fire breaking out on one side of the structure several times. This breaker was burned to the ground on Sept. 6, 1869, mothering to death 108 miners, who were at work. This was one of the largest disasters in the history of anthracite coal mining.

Bituminous

Washington—The McClane Mining Co. has contracted with the Roberts & Schaefer Co. for the installation of a Marcus picking table screen, to be installed at their tipple at Rich Hill Mine No. 1.

Pittsburgh—The United Coal Corporation has contracted with the Roberts & Schaefer Co. for the installation of a barge loading conveyor to be installed in the tipple at the Ella mine.

Johnstwyn—On account of the increased

Johnstown—On account of the increased number of influenza cases in the soft-coal region of Cambria County, the fuel admin-istration has ordered all salons closed in a chain of mining towns from Gallitzin to Portage a chain o to Portage.

Washington—R. C. Masten, of Pittsburgh, president of the Masten Coal Co., has purchased 860 acres of coal for \$450,000, according to information received here. The coal is located on the land of Owen Murphy, Donegal township, ten miles west of this

Homer City—A bathhouse has been erected here by the Homer City Coal Co., for the use of its employees. The structure is well equipped. Separate lockers for the clothing of the men and special equipment for drying and airing clothes, as well as showers with hot and cold water, are features of the building.

features of the building.

Huntingdon—A mine squeeze which occurred recently in the mine of Adam J. Black, at Broad Top City, was the greatest and most destructive in the history of the district. It happened in Cook Mine No. 3, and besides throwing 110 miners out of employment, the loss to Black is estimated at \$35,000. There were 57 mine cars, 100 tons of iron, equipment and miners' tools inclosed by the squeeze.

WEST VIRGINIA

Logan—With all equipment in place and with a new tipple completed, the No. 2 mine of the Maher-Purseglove Mining Co., at Chauncey, has been put in commission.

Beckley—The Mead-Tolliver Coal Co. is about ready to begin operations at its new "Thistle" mine, battery haulage hotors having been received within the last few days, this virtually completing the equipment for the mine.

Orange—In the near future the Orange

Orange—In the near future the Orange Gas Coal Co. will begin the mining and shipping of coal from its new mine in the Henshaw seam, at Orange, in the Coal River section. A. E. Moore is the general manager of the company.

KENTUCKY

Toler—The Roberts & Schaefer Co. has installed a Marcus picking table screen in the Bailey Coal Co. tipple.

Maysville—The Dodson Coal Co.'s ele-ttor was destroyed by fire on Nov. 23, ith a loss of about \$38,000, on which there as only small insurance.

Birminghum—A. H. Carpenter has been appointed assistant to Production Manager H. C. Selheimer, of the Fuel Administration in Alabama, and will devote his attention to the coke industry, endeavoring to bring about an increased yield and also an improvement in the quality of coke produced. As a result of demoralized conditions in coal mining, coke production has been badly hampered by the lack of the necessary coal for charging the ovens and also a shortage of labor. This situation is showing improvement and the output of coke is gaining slowly. The Brookside-Pratt Mining Co. has rehabilitated the battery of beehive ovens at the Murray Mine, near Blossburg, Ala., which has been idle for a number of years and will begin producing coke for the trade in the near future. There are 100 of these ovens. There is a shortage in the supply of both furnace and foundry coke. The New Castle Coal Co. is shipping about 2500 tons per month to the smelting interests in northern Mexico.

ILLINOIS

Edwardsville—The Beck-White Coal Co. has closed down its mine here and is removing the equipment.

moving the equipment.

Mt. Olive—The coal mines of this vicinity, after being closed several days on account of influenza, have reopened.

Springfield—It is estimated that the tonnage of Illinois coal in the past 30 days has been cut 50 per cent. on account of the influenza epidemic and the peace celebrations. The normal monthly supply of 4.500,000 tons will be reduced to about 2,600,000 tons for November.

Springfield—Miners of Springfield and vicinity have started a movement for the erection of a permanent home in this city. Under the present system the different locals meet in various parts of the city. Preliminary plans were made at a meeting of presidents and secretaries of the locals at the courthouse.

at the courthouse.

Springfeld—The various locals of the United Mine Workers are considering the permanent leasing of a hall for the meeting place of these organizations. At the present time there is no regular and permanent meeting place and the locals meet all over the city. Better results can be expected if the locals meet in one place, it is believed.

meet all over the city. Better results an be expected if the locals meet in one place, it is believed.

Marion—An interesting event in the past week was the breaking through from the Peabody No. 3 mine into the workings of the old Carterville district mine, which was abandoned on account of fire about four years ago. The old workings were found in good condition, with very little water and gas. The gas was the cause of the worry when the connection was made.

Murphysboro—The State Miners' Examining Board, of which William Hall. of Springfield, is president, held examinations here and in Duquoin on Dec. 2, and on Dec. 3 and 4 in Herrin. Other examinations announced are Dec. 5 and 6, West Frankfort; Dec. 7, Harrisburg; Dec. 9, Christopher; Dec. 11, Belleville; Dec. 12, Collinsville; Dec. 18, Peoria.

Carlinville—An advertisement of a sale of alien property in this vicinity has aroused considerable local interest. The sale involves about 30,000 acres of coal rights owned by the Ely Coal Co., of Girard, which has been seized by A. Mitchell Palmer, Alien Property Custodian, as alien-owned coal lands and will be sold at public sale to "100 per cent. Americans." It is expected that there will be some spirited bidding, as a large acreage of coal rights in one body in the state is uncommon and hard to purchase.

Foreign News

St. John's, Newfoundland.—The Reid Newfoundland Co. is developing along scientific lines a highly promising coal seam recently discovered near Codroy, on the west coast of the island, within one mile of the railroad and accessible to tidewater. It has been found to be 11 ft. in width and it is believed to be an extension of the

coal deposits of Cape Breton. Should its development prove commercially profitable, it is estimated that within 18 months it should be possible to obtain from this mine the 200,000 tons of coal now annually imported to Newfoundland from Nova Scotia. Important iron ore discoveries are also stated to have been made by the company, but no official announcement respecting them has been made.

Personals

J. Frank Hay, purchasing agent for the Buck Run Coal Co., Minersville, Penn., has resigned to accept a similar position with a railway company at Pottsville.

Joseph E. McGowan has been elected a member of the board of directors of the Maryland Coal Co., of Maryland, and the Maryland Coal Co., of West Virginia, succeeding Howard S. Dickson, deceased.

Thomas Kelshaw, inspector for the Coxe estate in the Hazleton region, has resigned to enter the employ of the Girard Water Co., as superintendent of its coal and water business in Schujkill County. W. E. Millington, formerly with the Girard estate, Pottsville, Penn., will succeed Mr. Kelshaw.

Dwight P. Robinson, a former partner of Stone & Webster, in charge of their construction and engineering business, has opened offices in New York under the name of Dwight P. Robinson & Co., Inc., constructing and consulting engineers. Associated with him will be R. M. Henderson, in charge of construction; C. W. E. Clarke, mechanical engineer; R. A. Philip and D. L. Galusha, electrical engineers, and M. E. Thomas, structural engineer.

Thomas, structural engineer.

Lieut.-Col. L. G. McCrum, who in private life is general manager of W. H. Bradford & Co. Inc., with mines in Somerset, Cambria and Huntingdon counties, Pennsylvania, and president of the Victor Coal Mining Co., of Somerset, Penn., has met with considerable success since he assumed the general managership of the Government Arsenal at Rock Island. In fact, so free from labor trouble was the arsenal, and so great a spirit of coöperation and loyalty had Colonel McCrum succeeded in inculcating among the thousands of employees, that his results have attracted the attention of official Washington. Colonel McCrum wincesume his duties with the Bradford company when his work with the Government comes to an end.

Obituary

F. N. Day, of Hazleton, Penn., secretary of Pardee & Co. for many years, died recently of ailments incident to old age.

John Pugh, of Kingston, Penn, aged 67, one of best known mining men in the anthracite coal region, died on Nov. 26, at his home, following a prolonged illness He was a man well versed in sinking mine shafts and his operations extend throughout the anthracite and soft coal fields of Pennsylvania and Virginia. His widow and three sons survive.

Evan D. John, director of the Illinois Department of Mines and Minerals, died at St. John's Hospital, Springfield, Ill., Thanksgiving morning, at 6:45 o'clock, after an illness of five weeks due to a complication of diseases. Mr. John was 57 years of age and ha? been prominent in state mine work for a number of years. He served several terms as mine inspector under Governors Tanner and Deneen, and was a member of the state mining board in 1910, serving for a time as its president. After the consolidation of various state bureaus under the direction of Governor Lowden, Mr. John was named Director of the State Lepartment of Mines and Minerals. In this capacity he had shown excellent judgment and ability, especially during the period of the war, when the mines of the state were taxed to their limit in producing coal. Mr. John was 57 years of age. His home was at Carbondale, Ill. He is survived by his widow, one son and three daughters.

Recent Coal and Coke Patents

Coal Mining Machine. J. Gricar, Lowell, Ariz., 1,278,333. Sept. 10, 1918. Filed Jan. 25, 1917. Serial No. 144,518.

Automatic Dumping Mining Car a Tipple. D. S. Allison, Salt Lake City, Ut 1.278,551, Sept. 10, 1918. Filed Mar. 1918. Serial No. 221,450.

Coking Apparatus. F. Pribyl, Wilmette, Ill., 1,279,757. Sept. 24, 1918. Filed Nov. 4, 1913. Serial No. 799,113

Dump Car Mechanism. S. Brow. cago, Ill., 1,280,152. Sept. 24, 1918. Apr. 17, 1918. Serial No. 228,995. Brown, Chi-1918. Filed

Mine Working Machine. N. A. Newdick, Columbus, Ohio, 1,278,196. Sept. 10, 1918. Filed Jan. 28, 1916. Serial No. 74,744.

Smoke Consumer. A. Habig, Montreal, Quebec, Can., 1,278,639. Sept. 10, 1918. Filed Oct. 26, 1915. Serial No. 58,007.

Smoke Consumer. R. J. Johnson, Lake Benton, Minn., 1,278,937. Sept. 17, 1918. Filed May 10, 1917. Serial No. 167,770.

Safety Device for Mine Cages. L. Pich-r, Fort Wayne, Ind., 1,278,742. Sept. 10, 18. Filed Jan. 10, 1918. Serial No. 211,207.

Coupling for Mining Cars. H. J. Williams, Nanticoke, Penn., 1,278,541. Sept. 10, 1918. Filed May 4, 1918. Serial No. 232,534.

Smoke Consuming Apparatus. I. Theren, Quebec, Can., 1,279,939. Sept. 24, 18. Filed Mar. 12, 1917. Serial No. rien, Q 1918. 154,197.

Furnace Arch. J. S. Fulton, assignor to nited Stokers Corporation, Chicago. Ill., 278,326. Sept. 10, 1918. Filed Oct. 31, 117. Serial No. 199,577.

Furnace Structure. R. M. Spencer, assignor Columbus Heating and Ventilating Co., Columbus, Ohio, 1,278,777. Sept. 10,1918. Filed Jan. 23, 1913. Serial No.

Industrial News

Manchester, Ky.—The Horse Creek Coal Co. has filed notice of an increase in its capital to \$24.000.

Columbus, Ohio—The Flint Ridge Coal Co. has increased its authorized capital from \$1000 to \$275,000.

Louisville, Ky.—The Harlan Coal Co. has filed notice of an increase in its capitalization from \$200,000 to \$250,000, to provide for proposed extension.

Youngstown, Ohio—The Youngstown Sheet and Tube Co. has completed arrangements for the construction of a large new coal-handling plant at its works.

Phillipsburg, Penn.—The Hindle Coal Co. as been incorporated with a capital of 20,000 to operate a general coal business, V. H. Hindle is the principle incorporator.

Sunbury, Penn.—The Shoop Coal Co. has been granted permission by the State Water Supply Commission to dredge coal from the Shamokin Creek in the vicinity of Sun-

Philadelphia, Penn.—The Holler Coal Co. has been incorporated with a capital of \$20,000, to engage in general coal-mining operations. B. D. Jones is the principal operations. incorporator.

Chicago, Ill.—The Chicago Pneumatic Tool Co. announces the appointment of L. C. Sprague as assistant secretary of the company, with headquarters at 52 Vander-bilt Ave., New York City.

Dover, N. H.—The Boston & Maine Rail-road Co., Boston, Mass., has awarded a con-tract to the H. Wales Lines Co., 134 State Street, Meriden, Conn., for the erection of a new coaling station at its local proper-ties.

Ashland, Ky.—The Lackey Mining Co., capital \$12,000, has been incorporated by J. W. Kitchen, Sam Porter and R. D. Clere. Mr. Kitchen is an extensive lumber operator with large interests in Kentucky and Tannassae

Webster, Penn.—The United Coal Co., First National Bank Building, Pittsburgh, has awarded a contract to Phiel & Miller, Wabash Building, Pittsburgh, for the construction of a new river coal tipple at its local properties.

Morton's Gap, Ky.—The Peerless Coal Mining Co. has been incorporated with a capital of \$60,000 to develop coal properties in the Morton's Gap district. H. L. Brown-ing, Cleve Medlock and William O'Bryant ing, Cleve Medlock a are the incorporators.

Charleston, W. Va.—The American Eagle Colliery Co. has been incorporated with a capital of \$600,000 to engage in general coal-mining operations. V. L. Black, George S. Crouch and L. G. Summerfield are the principal incorporators.

Chicago, Ill.—The John A. Stewart Electric Co., John A. Stewart, president, formerly of Cincinnati, Ohio, has opened offices in Chicago at Room 1034, 208 S. La Salle St. The company will handle second-hand machinery, both electric and steam.

Clarksburg, W. Va.—The Gaston Coal Co. has been incorporated with a capital of \$25,000 to engage in the development of coal properties in the vicinity of Clarksburg. James Cain, Elkins; and R. L. and H. L. Hart, Clarksburg, are the incorporators.

Scranton, Penn.—The Barton Coal Co., Scranton Life Insurance Building, is planning for the immediate erection of a new coal washer at its properties at Peckville, to have a capacity of 500 tons. The structure is estimated to cost \$15,000.

Sandy Run, Penn.—M. S. Kemmerer & Co. have completed arrangements for the construction of a new one-story coal breaker at their local properties, estimated to cost \$10,000. Frank B. Davenport, Coal Exchange Building, Wilkes-Barre, is engineer.

McKeesport, Penn.—The Firth Sterling Steel Co. has awarded a contract to Phiel & Miller. Wabash Building. Pittsburgh, for the construction of a large new coal-handling plant at its works, to cost, in connection with other improvements, approximately \$200,000. The Firth Sterling

mately \$200,000.

Charleston, W. Va.—The Charleston Coöperative Coal Co., recently incorporated with a capital of \$96,000, is planning to commence work at an early date on the development of approximately 900 acres of coal properties in the Riverview section, to have a capacity of 100 tons daily. H. J. Ferimer, Catlettsburg, Ky., is president.

Fairmont, W. Va.—A ruling of the state fuel administration, recently issued, requires all retail coal and coke dealers to register with the county fuel committee on or before Dec. 10. Such registration, which will be made without charge, is to be a prerequisite to the transaction of any business, and each such retail dealer must register in each county in which he deals.

Wilmington, Del.—It was announced on

ister in each county in which he deals. Willmington, Del.—It was announced on Nov. 25 that the Pennsylvania R. R. has jurchased ten acres of land adjoining the tract secured by them some time are at Gordon Heights, for their proposed coalpiers, which are to be moved from Greenwich Point. The lands purchased will enable the company to construct miles of tracks adjoining the piers and runs parallel with their present main line.

with their present main line.

Wilkes-Barre, Penn.—Wilkes-Barre's coal land assessment will be 25 per cent. higher during the next three years. This was decided on Nov. 23, at a neeting of the board of assessors under the triennial assessment. The coal lands today are valued in the city at \$15,000,000 and will be increased to almost \$21,000,000. Under the old assessment anthracite taxable property brought \$130,000 yearly in taxes to the city. property b

to the city.

Bluefield, W. Va.—The King Coal Co., according to a well-substantiated report, became a part of the extensive interests of the Houston Coal Co., headed by T. E. Houston, of Cincinnati, on Dec. 1. The King Coal Co. includes what was formerly operated as the Tidewater Coal and Coke Co. While the consideration involved has not been made public, it is said to involve a large sum and the deal is said to be one of the largest and most important consummated in West Virginia in some time.

Cincinnati. Ohio—At a meeting of leading

summated in West Virginia in some time.

Cincinnati, Ohio—At a meeting of leading members of the coal trade, including prominent operators and dealers, held at the Hotel Sinton on Nov. 25, the situation in this section was declared to be satisfactory for the coming winter, although the amount of coal available for distribution was stated to be limited. The volume of fuel stored by domestic consumers is such that there will be little suffering should very severe weather come, it was stated. The labor situation at the mines was discussed, as was the outlook for the export trade.

Charleston, W. Va.—Changes have been made in the districts of several of the district mine inspectors by the State Department of Mines. James Golden, of the Ninth district, has been transferred to the Fourth district at Fairmont. H. L. Butler has been transferred from the Fourteenth district to the Thirteenth at Welch. R. L. Lambee goes from the Tenth to the Ninth district at Macdonald. L. B. Holliday has been transferred from the Thirteenth to the Sixth district at Charleston, and Eli Mason will hereafter have charge of the Tenth district, being transferred from the Fifth district.

Charleston, W. Va.—The Chesapeake & Ohio Ry. has cut down the daily quota of

cars for each mining district receiving empties from its lines because of the reduction of production during a part of October, due principally to the influenza epidemic. Operators declare this is not fair because production would have been extremely large but for the epidemic. The road has promised, however, to see that mines have enough cars. The allotment reductions for empties measured in tons per day are as follows: Kanawha, from 42,570 to 26,650; New River, from 41,940 to 26,890; Coal River, from 16,400 to 9870; Guyan, from 67,930 to 41,340.

Washington, D. C.—At a meeting of the

Guyan, from 67,930 to 41,340.

Washington, D. C.—At a meeting of the executive committee of the National Retail Coal Merchants Association, held here Nov. 11 and 12, a number of important matters were discussed. Cyrus Garnsey, Jr., assistant Federal Fuel Administrator, metwith the committee and discussed freely many of the problems confronting the Administration and the retail dealers. The organization went on record as favoring 2000 lb. as the standard weight of a ton of coal, and the officers were authorized to secure legislation to that end. A resolution was adopted proposing the continuation of the Fuel Administration for the remainder of the coal year.

Columbus, Ohio—War prosperity, to-

of the coal year.

Columbus, Ohio—War prosperity, together with careful management, has resulted in the lifting of the receivership of the Sunday Creek Coal Co., of Columbus. The receivership was brought about more than three years ago by creditors, and John H. Winder was named as receiver. Previous to that time an equity in the company had been acquired by John S. Jones. During the receivership all of the claims were paid off, and Mr. Jones acquired practically all of the outstanding securities, including stocks and bonds. Attorney Barton Griffith has been president, but he is expected to resign, and Mr. Winder will be named to that position.

Philadelphia, Penn. — The Greensburg

named to that position.

Philadelphia, Penn. — The Greensburg Coal and Coke Co., Commercial Trust Building, has received a letter from the commanding general of the Eastern Department Headquarters of the United States Army, expressing deep appreciation of the hearty cooperation rendered by the company in the recent campaign to secure candidates for the Infantry Central Officers' Training School, at Camp Fremont, California. The Greensburg Coal and Coke Co. furnished office facilities and clerical assistance to Capt. H. G. Vawter, examining officer from the Eastern Headquarters, and rendered a service that was deemed of great value to the War Department.

Morgantown, W. Va,—What may be

great value to the War Department.

Morgantown, W. Va.—What may be termed the salvation of the Scott's Run operations, whose owners belong to what is known as the Scott's Run Operators' Association, is the decision of the Railroad Administration putting into effect a prorate between the Morgantown & Wheeling Ry., over which coal is transported to the connecting line—The Monongahela Ry.—and the latter line, relieving the operators of 40c. a ton on coal for a very short haul—a charge which threatened to drive the Scott's Run people out of business. Before the new rate becomes effective it will have to be approved by the circuit court, since the short-line railroad company is being operated by a receiver.

New York, N. Y.—The Exchange Bureau

to be approved by the circuit court, since the short-line railroad company is being operated by a receiver.

New York, N. Y.—The Exchange Bureau of the wholesale Coal Trade Association of New York, Inc., will be put into operation on Dec. 9, and the first list of offerings and requirements will be distributed the following day. But one change has been made in the rules, a summary of which has already been printed in Coal Age, (Vol. 14, No. 22, p. 1006), the price at which coal is offered will not be shown, it being decided by the Board of Directors that all matters other than the mere bringing together of the parties should be left to those directly interested. The Board of Directors also reached the conclusion that it will not be possible to extend the privileges of the Coal Exchange to retail dealers.

Toledo, Ohio—With the lake season almost over, lake shippers at this port are going over records to see just what the season had in store for them. On the whole the season was probably the most successful in the history of the lakes and a large tonnage was moved to the Northwest. The Hocking Valley docks up to Nov. 23 loaded 5,021,345 tons, which is almost 200,000 more tons than were loaded during the entire season of 1917. The docks loaded 100,487 tons during the week ending Nov. 23, compared with 125,798 tons the previous week. Officials of the Hocking Valley Rallway said that there were approximately 1600 cars yet to be loaded on vessels. The Toledo & Ohio Central docks during the week ending Nov. 23 loaded 5,000 tons as compared with 155,000 tons the previous week, making a total of 2,174,028 tons.

MARKET DEPARTMENT

Weekly Review

Opinion Divided as Regards Continuation of Federal Control of Soft Coal Industry-Strong Arguments for Returning Industry to Competitive Basis - Anthracite Situation Will Probably Right Itself by End of Year

CHALL the Federal Fuel Adminis-Stration continue to exercise its control of the coal industry, or shall it wind up its affairs at once and permit the law of supply and demand to prevail, as in pre-war days? This, in essence, is the all-absorbing question now being discussed in coal-trade circles. Opinion is by no means unani-Operators who are mining highmous. grade bituminous coal are emphatic in their demands that the industry be returned to a competitive basis, while those mine owners who are not so favorably situated as regards the excellence of their product desire that the Administration function until its life expires with the signing of the peace treaty. Indications, however, point to an early relinquishment of control of the soft-coal industry by the Adminis-tration; and the stage is being set with this end in view.

When the country was at war, every step taken to encourage maximum production was a step in the right direction, and every restriction placed on

distribution was so placed for a very definite reason. With the country at peace, however, most of these radical innovations are no longer necessary. Instead of quantity, the demand of the consumer is now for quality. The market is overstocked with soft coal, much of it of an inferior grade that can find no buyers. In the meantime the highgrade coals that consumers in certain zones would gladly purchase are being produced by mines in other sections of the country; and, unfortunately, many of these mines have been forced to curtail operations because the zoning laws prohibit them from shipping their product outside the established boundaries.

It is evident, therefore, that the Fuel Administration will go far toward stabilizing the coal industry and benefiting the consumer when it gives up control of bituminous coal. Inefficient mines, and mines producing poor coal, will then no longer be in position to market their product at prices which are beyond all reason, and high-grade coals will once more be enabled to sell

in localities where a demand exists for them.

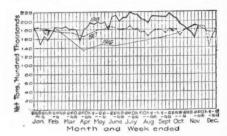
It can be stated as an axiom that whatever is true of soft coal is untrue of anthracite. This being the case, therefore, the continued control of the production and distribution of hard coal by the Fuel Administration would seem to be the most logical course to pursue in order to prevent profiteering. Anthracite is as scarce as bituminous is plentiful, though the shortage is confined chiefly to Pennsylvania, Delaware, New Jersey and New York-states that are quite near the source of supply.

The anthracite shortage in the local-ities named amounts to 626,776 tons, which is less than three average days' output of the mines. With augmentations to the labor forces from the ranks of those released from the army and discharged from munitions works and other war industries, it is expected that the deliveries of hard coal will be brought up to the allotments set by the authorities by the end of the year.

WEEKLY COAL PRODUCTION

WEEKLY COAL PRODUCTION

The record-breaking steady decline in the production of bituminous coal, from the high point of over 13,000,000 tons a week, the last of September, to less than 10,000,000 tons, seven weeks later, came to an end the middle of November. In the week ended Nov. 23 production rose to nearly 11,000,000 tons, a gain of 12.5 per cent. The estimated production in the week of Nov. 23, 1918, was 10,931,000 tons, compared with 9,703,000 tons in the week of Nov. 14, and 11,187,000 tons, or 2.3 per cent. less than in the corresponding week



of 1917. The average daily output rose from 1.617,000 tons to 1.820,000 tons, but below the figure of 1,865,000 tons for the corresponding week of 1917. The total production of bituminous coal and lignite, including coal coked, Apr. 1 to Nov. 23, is estimated at nearly 400,000,000 net tons, a gain over the corresponding period of 1917 of 40,000,000 tons, or 11 per cent. Reports of production and working time for the week of November 16 show for the first time this year loss of production because of no market comparable to the loss because of transportation disability. The transition in the comparatively short period of a few weeks from a condition of car shortage to one of car surplus is significant because indicative of the possibility of a

reversal later; with a return of unfavorable conditions. This condition has been brought about by the accumulation of stocks, made possible by the heavy shipments during the past four months, the possession of which has taken the keen edge off the industrial demand, and by the fair weather for this time of the year that, while favoring transportation, decreases the consumption of coar.

The production of anthracite in the week ended Nov. 23 is estimated at 1.778,000 net tons, an increase compared with the week of Nov. 16, of 373.000 tons, or nearly 27 per cent, but 263.00 tons, or nearly 27 per cent, but 263.00 tons, or nearly 27 to date. is estimated at 56,358,000 net tons. All districts except southwest Virginia shared in the increase in the week of Nov. 23 over the previous week, but all districts except Fairmont were below the corresponding week of 1917. The totals for the year to date for all districts are greater than the same period of 1917.

Coal dumped at Lake Erie ports, including vessel fuel, in the week ended Nov. 23 was 567,990 tons, a decrease of 71,500 tons compared with the week of Nov. 16. Nov. 23 marked the official closing of the lake season of 1918, and with nearly 28,000,000 tons of cargo coal dumped at lower lake ports set a new high record. Loading of coal at the mines for lake shipment ceased (except for small quantities of special-purpose coal) on Nov. 16, two weeks earlier than last year.

Shipments of bituminous coal to New England in the week ended Nov. 23 were 412,376 net tons, 1200 tons less than in the week ended Nov. 16, but below the average per week from Apr. 1 to date of 569,729 tons. Under the recently revised estimate of requirements New England is now up to schedule as to receipts of soft coal. In the week ended Nov. 23 increases over the previous week were recorded in the movement from Hampton Roads and Baltimore, and decreases through New York harbor and through New England all-rail gateways.

lantic ports decreased from 755,332 net tons in the week ended Nov. 16 to 735,843 tons in the week of Nov. 23. A slight increase at Baltimore was more than offset by deceases at New York and Philadelphia and at Hampton Roads.

The production of beehive coke in the United States in the week ended Nov. 23 is estimated at 521,000 tons, a decrease of nearly 6 per cent. below the previous week and 19 per cent. below the corresponding week of 1917. Although the output of beyproduct coke increased the total production of coke declined. Two-thirds of the decrease in output of beehive coke was in the Pennsylvania regions, where shortage of labor continues to be the chief limiting factor. Operators in the Connellsville, Greensburg and Latrobe districts of Pennsylvania report production of 275,497 tons of beehive coke and shipments of 135,550 tons of coal, both representing decreases compared with the week of Nov. 16.

The production of byproduct coke increased slightly in the week ended Nov. 23 from 571,00 tons to 574,800 tons. The percentage of capacity obtained in output decreased, however, from 88.7 to 88.3, and the increase in output is due to a gain in capacity, mainly in Pennsylvania and Ohio. The chief factor limiting output continues to be repairs to plants and affects nearly all sections, particularly Alabama. Kentucky, Massachusetts, New Yorkand Pennsylvania. Capacity production was reported from no state.

BUSINESS OPINIONS

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BUSINESS OPINIONS

Marshall Field & Co.—Current wholesale distribution of dry goods is running slightly less than for the corresponding week of 1917. Road sales for both immediate and future delivery also were a little below the total for the same period a year ago. The number of customers in the house was about the same as for the corresponding week of 1917. Collections are excellent.

Bradstreet's—Trade and industrial reports are more irregular than at any time since the peace armistice was signed, cancellations of government orders vying in

Interest with reports of former non-essential lines starting up or preparing to assume their old importance, and the general tendency is to strike a waiting attitude pending clearer views of future supplies and prices of materials and labor.

prices of materials and labor.

Dry Goods Economist—Retailers in all sections of the country report business as excellent, with the principal activities on holiday goods and materials needed for winter wear. The relief from the tension of war conditions is reflected in increased purchases of various commodities. Collections are good. Because of the practical ending of the war, the restrictions of the Council of National Defense which had been put on the sale of holiday goods, and on the employment of extra salespeople, by retailers, have been called off.

have been called off.

The Iron Age—The Steel Section of the War Industries Board has notified all steel manufacturers that it will discontinue allocation of steel on Nov. 30, and thereafter dealings will be directly between Government and other purchasing agents and the manufacturers. A conference at Washington, Dec. 11, between the manufacturers and the Price Fixing Committee may result in extending official prices, with or without change, for another three months, but there is a growing feeling in favor of an early return of the industry to a free basis. Nothing definite has developed concerning the large amounts of pig iron and steel said to be required for Europe. The need is not immediate and the supply of ships is problematical.

American Wool and Cotton Reporter—

lematical.

American Wool and Cotton Reporter—Until wool values have been definitely established for the readjustment period into which this country is now entering, the woolen and worsted industry must remain in great uncertainty as to future procedure. Canceling of orders for goods has disorganized the industry from top to bottom, and it may be some little time before a satisfactory working basis can be brought about. The Indian cotton crop is 2,000.000 bales short, so the Continent must come to this country for supplies to make up for this lack. As the Indian cotton crop is of low-grade quality, the demand on this account without doubt will absorb large quantities of the low-grade cotton here. Cancellation of Government orders for cotton goods since the armistice is the outstanding feature, offset by the talk of increased freight allowance for the same.

Atlantic Seaboard

BOSTON

Stagnation in the steam trade. Prospect of an end to price-fixing interests the trade. Receipts further reduced. Pennsylvania operators seem indifferent to New England business, yet it is hard to see where tonnage will be placed later. Hampton Roads situation unchanged. New York market dull. Question whether Tidewater Coal Exchange will be continued. Bituminous department of New England Fuel Administration now disbanded. Anthracite receipts show slight increase. Mild weather a sign of steady improvement. Retail prices advanced and restrictions practically off. Municipal distribution in Boston causes comment.

Municipal distribution in Boston causes comment.

Bituminous—A more lifeless market it would be hard to imagine. With overtime discentinued, and more than a few industries shutting down for two- and three-day periods, not to mention the average reserve supply of twenty weeks, steam coal is to-day the "druggiest" commodity in trade. It is almost amusing, after the tremendous efforts to save fuel and speed up the unloading of cars, that now, on the verge of winter, it is next to impossible to find a buyer, and the New England railroads are actually storing empty coal cars because their Western connections are not taking them back to the region. Indeed, there are empty coal cars stored on all connecting lines as well, and were it not for Government control there is more than one railroad that because of the extremely light traffic of all kinds would not pay expenses. Movement of coal in this territory is certainly at a low ebb, and there seems no one wise enough to make a safe prediction for the interval between now and Apr. 1.

Should the Government price cease to be effective, as now rumored will be the case, we shall have a highly interesting situation. It is thought that such a move will not in any way create an additional market, but what will become of the thousands of contracts approved by the Fuel Administra-

tion and stipulating the last effective Government price as the figure established for the balance of the contract term? In such a situation does any one suppose these provisions, although the essence of the contract, will remain unaffected if the market level is a dollar a ton less? There are a tot of interesting problems to work out, but apparently the fuel authorities have no wish to supervise the process.

Receipts continue the lightest of the year. The average daily movement of bituminous at the five New England gateways has dropped to 260 cars, and railroad fuel has been reduced to 58 cars, a total of 318 cars as compared with 750 in July and August. Water receipts show an even larger reduction. There are agencies at Hampton Roads that are practically confining themselves for the present to making up their debits in the Tidewater Coal Exchange, and chartering almost no bottoms at all. The larger distributors inland have their hands full to find outlet for such coal as reaches the terminals at this end, and every available inch of storage is being used in order to free boats without excessive demurrage. "Orders" are being padded freely. Some glaring cases of shipment being made on requisitions long out of date are the subject of comment among the

freely. Some glaring cases of simplications being made on requisitions long out of date are the subject of comment among the trade.

While a few operators in Pennsylvania are taking advantage of some of the emergency orders filed with them months ago, a large number of the mining interests have apparently no difficulty in moving their reduced output readily. In the high volatile fields production has diminished to such extent that emergency orders have been obliged to wait. In directions other than New England railroad fuel is in good request, and that has been a reason for the diffidence on the part of operators toward new business in New England. Some of the same shippers have coal due railroads in this territory, but they are headed for disappointment if they expect the coal to be received.

Wagon-coal has now disappeared from the market, so far as this district is concerned. Open-top cars are also being furnished the wagon-loaders, but on this equipment the 75c extra does not apply, and sales are few and far between on any coal of this origin.

The situation at Hampton Roads continues about the same as when last reported. Bottoms are available about as fast as the coal reaches the piers, and there are now comparatively few cases of detention. The number of boats loading for New England, however, is relatively small, due to the great difficulty of arranging for disposition at this end.

An interesting question involves the furture of the Tildawater Coal Exchange.

however, is relatively small, due to the great difficulty of arranging for disposition at this end.

An interesting question involves the future of the Tidewater Coal Exchange. Through our troublous period all will agree that it has made a surprisingly good showing, and undoubtedly railroad management in general will strongly favor its continuance. On the other hand, the coal of individual shippers and agencies loses its identity, and thereby the shippers in many cases are deprived of a great asset in trade. All things considered, the latter interests are likely to prevail in the end, for too much of the competitive feature of the business would be eliminated.

The New England Fuel Administrator announced on Dec. 1 that he relinquished all control of the distribution of bituminous, leaving the steam grades to be handled through normal trade channels. The bituminous staff has therefore been disbanded.

Anthracite—Receipts of domestic sizes

through normal trade channels. The bituminous staff has therefore been disbanded.

Anthracite—Receipts of domestic sizes all-rail improved slightly the week beginning Nov. 24. The daily average was 337 cars, or 21 more than for the week previous. Water receipts were also somewhat better, although there is room yet for improved shipments by barge from New York. There are multiplying signs of easier conditions in hard coal generally. There has been a great deal of duplication in entering applications on the part of the general public, and this situation has been extremely hard to police. The recent advance of \$1.05 at the mines and the end of the warhave accomplished what no amount of regulation could have achieved. The result is a great sifting of the orders now on the books of retailers, and householders beyond number are discovering they have on hand in their cellars enough to see them comfortably through the season. The mild weather has also had a great deal to do with this, and should it continue for a few more weeks and production increase, as we have reason to expect, there will soon be a marked change in the anthracite situation. In many cases retailers who supposed themselves to be far short of the receipts they should have had are finding their current business much reduced in comparison with normal years. The buying of bag coal and fractions of a ton has been very much reduced, due to higher wages and the great

extent to which the laboring class bought their six-ton lots as fast as the coal could be had.

It is probable that the fuel authorities will retain supervision of anthracite for their six-ton lots as fast as the coal could be had.

It is probable that the fuel authorities will retain supervision of anthracite for some weeks to come, although there are indications here that even this will be of short duration. Emergency coal to the extent of 70 cars daily is moving to the order of Mr. Storrow at the five gateways, but it apparent that something like the "last call" will soon be issued to those towns that are still behind on their quotas. These latter are communities where the retailers have rather weaker connections, and it is to assist such situations that "free Storrow coal" is still being distributed.

Effective Nov. 29, the Boston Fuel Committee, acting on the advice of Mr. Storrow, allowed an advance of \$1 a ton at retail to take care of the wholesale advance applying on coal mined beginning Nov. 1. Boston local prices are now as follows:

Broken, egg, stove, and chestnut..... \$12

Broken, egg, stove, and chestnut..

Domestic sizes of anthracite short, and various industries must not be served with egg, stove or chestnut. Supply of buckwheat and smaller sizes plentiful. Epidemic reported to be lessening. Return of soldiers will be the salvation of the industry. Slump in bituminous narrowly averted. Slow up in production believed to have prevented drop in prices. Additional pools added to coals available for bunker purposes.

drop in prices. Additional pools added to coals available for bunker purposes.

Anthracite—Conditions in the New York market are far from satisfactory from the viewpoint of a consumer of domestic sizes. Users of pea and the smaller coals have nothing to fear. There is more than plenty of these sizes to take care of their needs, and many household consumers are using. No. 1 buckwheat in their furnaces with egg coal. There is plenty of this size to be had while the quantity of pea coal on hand is said to be unusually large for this season of the year. This is due to the failure of the consuming public to take advantage of the opportunity to secure pea coal, which could be used in most instances instead of chestnut.

An order dated Nov. 22, issued by Reeve Schley, New York County Fuel Administrator, forbidding the delivery of domestic sizes, including pea and larger, to office buildings, banks, retail and department stores, city club houses, loft buildings and numerous other similar classes of consumers, was temporarily modified on Nov. 27 so as to permit the delivery of pea coal to such consumers. At the same time retail dealers are urged to make every effort to substitute broken or pea sizes to domestic consumers who have ordered egg, stove or nut sizes, even to the extent of advising such consumers that they may not be able to obtain the size they have ordered.

Reports from the anthracite fields re-

not be able to obtain the size they have ordered.

Reports from the anthracite fields received here indicate a slight increase in production, with a continued increase in sight

now that the influenza epidemic seems to be letting up, and mine workers who temporarily bettered themselves in other industries are returning to the mines. It is estimated that if the 7500 mine workers to be released by the War Department will return to their former jobs their return will increase the output of coal from 300,000 to 350,000 tons a month.

The Anthracite Committee of the Fuel Administration continues to place embargoes on shipments to communities in various states, directing the distributors to concentrate deliveries to other points in the same states. The Committee also issued an order discontinuing shipments of domestic sizes, including pea, to 216 communities in the Province of Ontario, Canada, and directing that shipments be concentrated to other communities in the Province.

Dumpings at the local docks continue to

and directing that supments be concentrated to other communities in the Province.

Dumpings at the local docks continue to show a falling off. For the week ended Nov. 29, 4869 cars were dumped as compared with 5599 cars the previous week. For the 30 days of November 21,891 cars were dumped, according to the reports of the Regional Director of Railroads, as compared with 26,616 cars in October and 27,944 cars in September.

The situation as regards egg, stove and chestnut in New York is serious. Dealers are well booked ahead with orders for these three sizes. There is an unusually large supply of broken coal on hand, while peacoal is more plentiful than usual.

With No. 1 buckwheat being delivered to householders, the supply will soon diminish to normal conditions. There is a large accumulation of rice and barley, with some cutting of barley prices reported. Inducements, it is reported, are being made to buvers of these two sizes of an equal quantity of bituminous coal if wanted.

Current quotations, per gross ton, f.o.b., tidewater, at the lower ports are as follows:

Circular	Individual	Circular	Individua
Broken\$7.80	\$8.55	Buck \$5.10	\$5.90
Egg 7.70		Rice 4.65	
Stove 7.95	8.70	Barley., 4.15	4.30
Chestnut 8.05		Boiler 4.60	
D. 6 55	7 30		

Chestnut 8.05 8.80 Boiler. 4.10

Pea... 6.55 7.30

Bituminous—The influenza epidemic has proved to be the salvation of the situation. To its ravages many shippers attribute the present stability of the market, for without it or some other agency which would have resulted in a curtailing of production, such as the epidemic caused, there would have been a surplus of coal as to have resulted in an overloaded market and a severe cutting of Government prices. At present there is no great surplus of coal and prices are holding steady.

There is a good demand and producers of high grades are having more or less trouble in taking care of their regular trade. This is due in most part to the numerous Government orders and demands for railroad fuel. Cars are in good supply, but labor is short because of illness which is said to be increasing in certain sections of the central Pennsylvania fields. The situation in that section is serious, and producers find themselves hardly able to take care of current needs.

The cancellation of the storage regulations had no appreciable effect on conditions. While the ban has been lifted from many of the so-called non-essential industries, there is a shortage of labor and no need for a full supply of fuel such as would be necessary under normal conditions.

Producers say that many of the mine workers who have been ill from influenza are now returning to their work, but owing to their weakened condition are not able to remain all day. They are, however, showing their willingness to do their part in regaining some of the tonnage lost will be made up, but the operators hope to increase production sufficiently to take care of current needs and to prevent any further shortage. Considerable will depend, however, upon the time required for industrial conditions to become adjusted.

The report from Washington on Nov. 30 that Dr. Garfield may remove the price restrictions on bituminous elicited little comment among the trade. No one cared to vouchsafe what might or might not happen in such an ev

The decrease in production is reflected in the dumpings at the local piers for the week ended Nov. 29, 5037 cars having been dumped as compared with 6121 cars the previous week. For the month of November, 24,582 cars were dumped as compared with 28,568 cars in October and 30,440 cars in September.

Current quotations, based on Government prices at the mines, net ton f.o.b., tidewater at the lower ports, are as follows:

And Piedmont Fields: Run-of Mine	Central Pennsylvania: Mine-Run, prepared or slack Upper Potomac, Cumberlan	Mine Gross	F.o.b. N. Y. Gross \$5.45
	Run-of Mine	3.36	5.51

PHILADELPHIA

Anthracite dealers complain of light de-liveries. Improvement sporadic. Retailers planning for peace conditions. Stove and nut searce, pea fairly free, egg plentiful. Inside information is that situation will be met. Steam sizes about normal. New wage demands upon retailers. Bituminous shows some signs of stiffening. High-grade coals scarce. Wagon mines cut. Bunker coal scarce.

coals scarce. Wagon mines cut. Bunker coal scarce.

Anthracite—Another week of strained relationship between the dealers and their shippers must be recorded. Just as the climax of dissatisfaction appeared to be reached, the largest operating company commenced consigning coal to this market. From present plans, it would seem that the trade of these shippers, which is located chiefly on the Philadelphia & Reading tracks, will receive substantial allotments for two or three weeks. This is not certain, however, and the trade has been so advised, because past experience has shown that preferential instructions may be received from the fuel people for some other points that may change the present arrangements. It is intimated that the present improvement is due to the shutting off of lake shipments, although we hardly believe this can account entirely for the increased shipments by one company, which is continuing a fair volume of tonnage all-rail to lake destinations.

In spite of severe criticism of the Fuel Administration, all hands admit, however, that the regulation of prices and the selling of coal at a fixed margin of gross profit has been most beneficial. Dealers are already discussing the possibilities of coperation after peace has been finally declared and the Fuel Administration has gone out of existence. They hope to keep their business on the high plane which the administration has placed it, and to eliminate the price cutter, whose methods were often questionable. This city was probably the worst affected community in the country from the point of price-cutting and its attendant evils, such as extension of long credits in order to procure competitive business.

As for the past few weeks, the cry is still for stove and nut sizes, and unques-

As for the past few weeks, the cry is still for stove and nut sizes, and unquestionably there is less of these two sizes in the yards than at any time since last winter. Every dealer is being tormented by his customers, and the dealers in turnare making miserable the lives of their shippers. With the possible exception of several of the suburbar yards, all report as being in very fair shape on egg coal. Pea coal is still in stock in a number of the yards, where efforts are being made to have buyers accept it as a substitute for chestnut.

In talking with representatives of various

In talking with representatives of various cperating interests, they are most optimistic as to the city's needs being cared for this winter. A number of them predict that they will actually have their sales forces on the road in March soliciting orders, and go further in saying that if the winter is a mild one this will happen even earlier. Some concerns even now occasionally send out their sales forces to ascertain the lay of the land, as it is felt that the business of each concern will be considerably rebuilt when the dealers once more have the opportunity of selecting their shippers.

In the steam coals, buckwheat has re-

In the steam coals, buckwheat has re-cently shown unexpected strength. In this connection one of the local retailers adver-tised buckwheat as a domestic fuel this week, quoting a delivered price of \$6.75 per gross ton. This was the first direct advertising of any coal dealer for over a year. Rice has also improved to a moder-ate degree, while the same cannot be said

of barley. Ever since bituminous became easier the demand for the anthracite steam sizes under buckwheat have fallen off very much.

The retail dealers have lately bear

much.

The retail dealers have lately been confronted with new wage demands by their help. The yardmen want a minimum wage of \$26. The men insist on a half-day Saturday, except July and August, when the yards shall be closed, but with full pay. Overtime to be at the rate of 75c. an hour after 5.30 p. m., and time and half time after 12 noon Saturday. Inasmuch as the fuel administration has refused to grant the retailers an increased margin, the demands have practically been rejected by the retailers.

The prices per gross ton c.o.d. cars at

by the retailers.

The prices per gross ton c.o.d. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	\$4.90	\$6.25	Buckwheat.	\$3.40	\$4.45
			Rice	2.90	
			Boiler	2.70	3.70
Nut	5.15	6.50	Barley	2.40	3.30
Don	2 75	5 00	Culm	1 25	2 15

BALTIMORE

Every day sees an increase in soft-coal offerings, although best grades are still held tightly. Hard-coal situation aided by mild

tightly. Hard-coal situation aided by mild weather.

Bituminous—An easing bituminous situation is in evidence. For the first time in months there are a number of men here with coal to sell or who will have coal to sell shortly; and many letters are coming through daily from mines offering coal to jobbers or consumers, or feeling out for future relations as soon as additional war contracts are announced. Box-car coal has been almost completely kept from the market for a few days, and in some regions the Baltimore & Ohio placed an embargo against movement of that character.

The receipts of open-top coal here, and some little box-car coal, chiefly on orders of some little box-car coal, chiefly on orders of some little standing, have been ample to care for all needs. Better grade coals are still tightly held, however, through the fact that the Government has not released them to the general market. In this connection it is a little odd to know that while such coals are not available in any quantity as yet for the open market, that at times there is a big accumulation here for Government account. In some cases several hundred carloads of high-grade coal have remained on sidings and at terminals here for many days at a time before being moved. At one time last week one Government pool here had over 400 carloads of high-grade coal standing.

Reports from the mining district are to the effect that production has dropped off because miners will no longer hustle as they did under the lash of patriotic endeavor. Two-, three- and four-day-time men are again developing, and the higher wage scale of these days seems an inducement in many cases to do only a part week. For the time being, however, this cut in production has probably aided materially in stabilizing the market and preventing quotations here from going below the Government maximum.

de se la ar m ha ar

Anthracite—The hard-coal situation here has been made a little easier than expected through the continuance of mild weather. The estimate that around 100,000 tons still remained on the books undelivered, and that as much more would like attention at least in part immediately, has been softened by the fact that a number of additional consumers have been given one- and two-ton lots. Stove and nut coal remain very scarce here, and those who can only use those fuels are in more serious plight than consumers who can use egg or pea.

Lake Markets

PITTSBURGH

Market shows no softening. Celebra-tions and influenza cut deeply in produc-tion. Wagon mines still operating.

Prospects of the Pittsburgh coal market dropping below the maximum Government limits have receded almost to the vanishing point, the curtailment in production in the past three weeks disclosing what light stocks were carried by consumers tributary to the district. In this regard the situation is different from that obtaining with much territory served by Ohio and more western districts. The increased demands made upon the Pittsburgh district for coal for lake shipments, beyond the original quota for the district, prevented any material accumulation of Pittsburgh coal by consumers.

for lake shipments, beyond the original quota for the district, prevented any material accumulation of Pittsburgh coal by consumers.

Production of coal in the Pittsburgh district had reached a rate of about 1,200,000 net tons a week, when lake shipments were at from 300,000 to 350,000 tons a week (owing partly to the peace celebration and partly to increased effects from the epidemic of influenza, production was only 700,000 tons in the week ended Nov. 16, the week of the peace celebration, and there was an increase only to 800,000 tons in the following week. Production last week, with a holiday, is not reported yet, but was probably less than 800,000 tons, as working forces on Friday were not as large as in the first three days of the week. Shipments of Pittsburgh coal have been shut off except to certain specified consumers, including railroads, byproduct coke ovens, public utilities and retail dealers, but application can be made for coal by consumers who show that they have no stocks to draw upon. The byproduct ovens are but indifferently supplied, and have little by way of stocks.

There has been no important cessation of operation by wagon mines, and they are still obtaining full limit prices. By reason of the extra trucking charge allowed, on which a profit is made, their selling prices are higher than those of rail mines. and if there is to be any decline in the regular Pittsburgh market it will be preceded by a closing of many of the wagon mines. Thus, apparently the trade would have ample warning of a prospective market decline; yet there are many consumers even now seeking to buy at cut prices, entirely without success, and the market is quotable firm at Government limits; slack, \$2.10; mine-run, \$2.35; screened, \$2.60, per net ton at mine, Pittsburgh district.

CLEVELAND

Excepting only an occasional holdover cargo, the lake season has come to an end. Steam-coal users, for all practical purposes, are not buying a ton, seeking to use up the high-cost fuel in their stockpiles. Domestic users have supplies sufficient to tide them over the turn of the year, when they believe prices will recede.

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Bituminous—Big blocks of low-grade coal, comprised mainly of the outerop from stripping operations, have been thrown on the market in northern Ohio at from 50c. to \$1 under the Government maximum. A concession of 70c. seems to be the favorite figure. While it no doubt is true that a few scattering operators, alarmed at seeing surplus piles at the mines increasing, have made slight concessions on standard No. 8 coal, the great majority of operators appear to be standing pat. Declarations that they will shut down their mines before they will shut down their mines before they will shude the Government schedule are frequently and firmly made. The steam-coal market seems to have developed into a tug between buyers and sellers. Industrial plants now have the labor to bring in fuel from stockpiles and are not buying at all. The few plants that must have spot supplies are buying from hand to mouth. Opinion is unanimous among steam-coal users that prices are going down. Operators on the other hand are just as insistent that under present conditions they cannot make much of a concession before they reach the deadline on profits. The weight of the "bear" argument is that if enough buyers hold out long enough prices will tumble. Stripping property operators and producers of No. 6 and other so-called low-grade coal have succumbed, and are making many of their proffers on this basis: "If you won't consider this block at so much off the Government maximum, what will you offer for it?"

Car supply at Ohio mines has picked up markedly, and now is less than 15 per cent.

for it?"

Car supply at Ohio mines has picked up markedly, and now is less than 15 per cent, short. So far as production and shipments are concerned, the supply is 100 per cent.

The end of the lake trade for 1918 has resulted in some gondolas being put in storage. The railroads themselves now are taking very little fuel for they, like the industrials, have stockpiles to reduce. With Thursday out for Thanksgiving, the hunting season on and influenza not yet entirely bested, last week virtually was a threeday one. Operators are content with such a situation, not pressing their employees or seeking to obtain more than a nominal output, with the market so much narrower. Cold weather that set in early last week made the domestic market much more brisk, but not to any great extent. Domestic consumers have half their winter's coal in, generally speaking, and are showing a disposition not to buy the other half until necessity impels. Retailers are seeking business just as earnestly as in pre-war days, but without resorting to cut prices except in occasional instances.

Anthractle—County Fuel Administration of hostilities will not effect an increase in the district's allotment of anthracite. Receipts continue nominal and, if anything, are decreasing. Domestic consumers are preferring the better grades of No. 8 coal now available to the No. 1 buckwheat they are offered.

Lake Trade—The Northwest's 28,000,000 tons of bituminous was floated by the offi-

are offered.

Lake Trade—The Northwest's 28,000,000 tons of bituminous was floated by the official ending of the lake season Nov. 23, and the daily loadings at Lake Erie ports last week, which had to be specially arranged through the Coal and Ore Exchanges, averaged less than 40,000 tons, or four vessels. Anthracite will be shipped from Buffalo so long as the carriers are operated.

DETROIT

Heavy stocks of bituminous at industrial plants and in yards of retailers prevent normal seasonal business. Anthracite sup-ply deficient. Lake movement drags.

plants and in yards of retailers prevent normal seasonal business. Anthracite supply deficient. Lake movement drags.

Bituminous—Due to the somewhat frenzied buying of a few weeks ago, many of the leading users of steam coal and numerous retail dealers find they are holding larger stocks than they desire to carry. This situation has cut down the volume of buying and produced a market condition more sluggish than is customary at this season of the year. Jobbers have been able to do very little business, aside from that coming from steam-coal consumers whose storage facilities are restricted and who therefore find it necessary to operate on a basis of hand-to-mouth.

The circumstance that considerable of the coal in stockpiles is the product of mines in Indiana and Illinois that are not producers of the best coals in those states is said by some of the jobbers to be the probable explanation of why a number of the stockpiles have taken fire. The fact that much of this coal has also found its way into yards of retailers is one of the reasons suggested for slow absorption by household consumers.

Such buyers who have been compelled to forego the exclusive use of anthracite in heating plants feel that if bituminous is to be substituted, it should be a high quality of bituminous from West Virginia and Ohio, instead of the lower grade coals. The retailers who are loaded up with the Illinois and Indiana coal, however, are not now in position to supply the better class of stock.

Anthracite—Householders are still clamoring for anthracite, while the supply re-

of stock.

Anthracite—Householders are still clamoring for anthracite, while the supply remains light. Receipts in the local market in November are much short of the movement in October. The state fuel administrator has given warning that chestnut and stove sizes are to be reserved to enable distribution of another two tons to users of baseburner heaters.

Lake Trade—Loading of coal for lake shipment was practically finished on Nov. 23. There are, however, a few shippers who are still striving to fill shortages on their commitments. Because of the active demand for vessel capacity for holding storage cargoes of grain, the supply of tonnage to be had for moving coal is becoming daily more limited. Anthracite forms a considerable proportion of the present lake shipments. shipments

COLUMBUS

The coal trade in Ohio is still rather weak, more especially in steam grades. Consumers are using surplus stocks and are loath to buy heavily at this time. Some price cutting results.

The Ohio trade is in a period of read-justment, which is affecting every depart-ment of the industry. The domestic trade is least affected because of a good demand for lump among certain dealers. Retailers look forward to a good trade as soon as weather conditions are more favorable, out so far there have been no cold snaps to

stimulate trade. Reports show that fully 75 per cent. of the fuel required in cities has been stored by householders. In the rural sections, however, it is believed that no more than 35 or 40 per cent. has been stored. Consequently, dealers in the smaller towns are looking for a good trade in the near future. Retail prices have not been cut, and there is no indication of shading soon. The so-called fancy grades, such as New River and splints, are in the best demand. No Pocahontas is coming into the local market. Anthracite is practically out of the market. Dealers have considerable mine-run, which will probably prove an elephant on their hands.

The steam business shows the most weakness. Steam users have reserve stocks to last for two to five months, and are thus not inclined to buy for the future. As a result there is a slight overproduction of mine-run and slack. Some mines have been closed down for want of orders, and there will probably follow suit unless conditions are radically changed. Railroads are not taking as much fuel as formerly. On the whole, the steam trade is in bad shape.

The lake trade is now practically over,

On the whole, the steam trade is in bad shape.

The lake trade is now practically over, although some coal was loaded during the past week. The cargoes were generally those of boat lines controlled by shipping companies. The Northwest is now well supplied with fuel, and no famine is anticipated in that section. The season was one of the most active in the history of the lake trade.

Production in Ohio fields is still curtailed by influenza. In addition, lack of orders is cutting into the output. As a result of the slowing down, the production in the Hocking Valley field is estimated at 60 per cent. Pomeroy Bend is producing about 55 per cent., and the same figures are reported from Cambridge and Crooksville. Eastern Ohio has been having a good car supply, and the output is nearly 70 per cent.

CINCINNATI

Colder weather has stimulated demand somewhat, but industrial demand continues cautious. Supplies are improving, with bet-ier conditions at mines.

somewhat, but industrial demand continues, cautious. Supplies are improving, with better conditions at mines.

Decidedly colder weather during the past week, the most wintry of the season so far, resulted in the usual stimulus to business, as the demand for coal for heating purposes developed from both domestic and other consumers who had not stored fuel during the summer and early fall months. Retailers are well supplied, however, and the flurry did not cause any great excitement among jobbers and operators' agents. Discussion among the trade has centered principally on the prospects for industrial business during the remainder of the winter and next spring, as cancellation of war orders among some branches of industry has resulted in some alarm regarding the future of these industries.

Reports from Washington indicate that there will be come effort made to prevent undue hardship on concerns having war concontracts, but this is not expected to enable them to continue operating on the same full basis which has been the case for the past year. In lines not dependent on the war, activity promises to be on a normal scale, if not larger, and consumption of fuel will accordingly be up to the usual mark.

On the whole, prospects for the coal business are taken as satisfactory, although the unbroken record of an excess of demand over supply which existed last winter is not expected. More vigorous sales work is therefore in prospect than has been necessary for more than a year, and the trade is getting down to business under conditions approximating those prevailing before the war.

LOUISVILLE

Colder weather only prospect for increased business at the present time. Domestic demand very quiet, industrial demand quieter, and general market dead. Some price cutting reported.

The steam demand represents merely hand to mouth, or actual requirements of consumers. Everyone apparently has stopped stocking, and the general opinion of consumers now is that they can get all the coal they want, when they want it. With industrial conditions unsettled, the steam consumers do not care to tie up money in coal. Many industrial plants are reducing working hours from ten to nine and even eight, including some of the railroad shops. This is naturally reducing steam consumption, as industrial demand of all kind has slacked off since peace was declared and cancellations of orders started coming in.

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In the mining sections things are virtually at a standstill. Many new companies, incorporated recently and planning developments, are holding up until they see

how things are going to work out. Several concerns which had taken bids on additional buildings have held up contract awards. Many of the larger mining companies have no business on hand and very little in sight. While few companies are reported to be laying off labor, at the same time no one is replacing men who are leaving, or making any attempt to secure hands or get back men who went into other industries. Unless the demand picks up shortly it is believed that some of the mines will be forced to cut working hours and lay men off.

The powder plant at Nashville which had been taking a large volume of coal from western Kentucky has reduced operations materially, and this has thrown an additional supply on domestic and steam markets which had been figured for Nashville. The operators of the Pittsburgh and West Virginia fields, who for some time have been forgetting river coal and making no attempt to ship to lower Ohio and Mississippl River points, are showing interest in recruiting barges and towboats to handle river coal. Some fair shipments have come down the Ohio whenever boating stages would permit.

Several reports have been received during the past few days relative to price cutting. A few small retailers have been cutting prices 15c. to 20c. under Government prices in order to secure business. Wagon mines have also been cutting prices in order to secure business. Wagon mines have also been cutting prices in order to secure business. Wagon mines have also been cutting prices in order to secure business. Wagon mines have also been cutting prices in order to secure business. Wagon mines have also been cutting prices in order to secure business. Wagon mines have also been cutting prices in order to secure business.

BIRMINGHAM

Steam trade requirements fair, but no insistent demand except from the railroads and public utilities. Domestic holds up strong, with no improvement in the supply. Production from 75 to 80 per cent. normal.

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Steam coal consumers in industrial lines appear to be fairly well stocked on coal and are content with receiving their regular stipulated shipments, and in some cases have expressed a desire for a curtailment. However, the railroads and public utilities seem to be short and are taking all the coal that is available for application on their requirements. They are probably looking ahead to the Christmas holidays, as it is pretty generally anticipated that mine workers will celebrate more extensively this season than usual, and there will be a heavy slump in the output. Local coal men are of the opinion that the trade will hold up well through the coming winter and that there will be ample demand to absorb the anticipated production. The Fuel Administration has lifted the ban on coal storage and supply for industries classed as non-essential during the war, which should increase the demand to some extent.

Domestic trade is active and there is a great scarcity of coal of this grade. Retailers have not accumulated stocks to any extent, as consumers have kept up a lively demand since Apr. 1 and there is far more coal in storage than ever before in this section.

Production is improving slowly, owing to the great extent to which idlenges exists

coal in storage than ever before in this section.

Production is improving slowly, owing to the great extent to which idleness exists on the part of the mine workers, and the output for the week ending Nov. 16 reached the low level of 329,190 net tons, a decrease of some 19,000 tons compared with the previous week.

Director General William G. McAdoo spent a short time in the city Thanksgiving day, and during his visit reviewed with representatives of the civic associations the proposed plans for Warrior River development, which have been favorably reported upon by Government investigators.

Coke

CONNELLSVILLE

Increased curtailment in production, leading to blast furnaces banking. Terms of contracts for first half. Market firm.

The curtailment in Connellsville coke product that began in October was at first not felt by blast furnaces, which seemed still to be adequately supplied. The blast furnaces had some stocks, but they averaged less than a week's supply. As production has continued fo decline, the blast furnaces have been seriously affected. The Carnegle Steel Co. alone has banked five blast furnaces on account of insufficient coke supplies, and all the banked furnaces are tributary to the Frick ovens in the Connellsville region. The company has blown out one stack at Forrell, for

rebuilding, thus releasing some byproduct coke, or the situation would be worse. The company now has 50 furnaces operating, with five banked and four out of blast.

During September production of coke in the Connellsville and Lower Connellsville region averaged fully 340,000 tons a week, there being a progressive decline, until at the end of October the rate was under 300,000 tons. Week before last production was under 250,000 tons, chiefly on account of influenza, and last week's production, with a holiday intervening also, may not have been over 225,000 tons.

Among coke consumers there was an expectation the end of the war would be followed rather promptly by a decline in the coke market from the Government maximum limits. If a decline really was due, it has been forestalled by this sharp decrease in production, and there has also been a decrease, although a relatively slight one, in the production of byproduct coke. The majority of blast furnaces that use merchant coke have made contracts at one time or another for their supplies for the first half of the new year, the usual form of contract specifying the Government price at time of delivery, or if there is no Government price then the open market obtaining. There has been so much of this contracting that there is a little question whether, in the event of Government price control being withdrawn, there will be enough open market business to establish clearly an open market business to establish clearly an open market price from time to time. The market is quotable very firm at Government limits: Furnace, \$6; foundry, 72-hour selected, \$7; crushed, over ½-in., \$7.30; clean screenings, over ½-in., \$5.50, per net ton at ovens.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Nov. 23 at 242,105 tons, a decrease of 17,825 tons, a decrease of 19,444 tons.

Middle Western

GENERAL REVIEW

Coal production falling off. Buyers not in market and producers do not expect any change in market conditions before Jan. 1.

Coal production failing off. Buyers not in market and producers do not expect any change in market conditions before Jan. I.

A glance at the recent Government reports on tonnage of coal produced in the United States shows a big decrease in production. This general tendency holds true in the producing districts of this territory, as the figures in the district representative's office show that the tonnage for this week will be even smaller than that of the week previous. Under the circumstances, this decrease is a good thing, as it is keeping the market from becoming utterly demoralized.

Operators have made up their minds to close their mines one or two days a week rather than operate at full time and have unsold coal on their tracks at night. This decrease in the production figures for Illinois and Indiana has had little effect on the buying public. Instead of being alarmed over the situation, they are not interested and are not purchasing coal. The state of mind of the average purchasing agent appears to be that he now has an opportunity to burn the storage coal helaid in during the summer, and has therefore cut off all further shipments of coal.

The gist of interviews with a number of the larger operators appears to show that the general opinion is that the coal industry in the Mid-West district will have to face an unprecedented hardship until say from Jan. 1 to Mar. 31. After that period the optimists claim that the reconstruction program will be well under way, and consequently will work a relief to the operators. In the meantime, not much change in market conditions is to be looked for, at least before the first of January.

CHICAGO

In spite of cold weather market condi-tions are sluggish. Anthracite situation improving.

Chicago had one or two days of cold weather last week, but it was not enough to make much change in either the steam or retail situation. Both the householders and the large industries have enough coal on hand to last for some time, and, contary to previous conditions, the market will not be subject to much fluctuation on account of weather conditions. During the height of the cold spell there was little demand for domestic coal, either the cheaper grades or the best to be had from the Southern fields of Illinois.

The anthracite situation is perhaps a

little better than heretofore, as most of the dealers are getting all the anthracite they have room for. The trouble appears to be that once the dealer receives his hard coal, he is unable to dispose of it, on account of the many rules and regulations devised by the state fuel administration.

The market continues quiet with mild weather. Pleuty of cars, transportation good, and no demand for steam or domestic. Railroad coal movement good. Prospects not encouraging.

The St. Louis market continues heavy, with nothing encouraging to look forward to, unless it be some extraordinarily severe winter weather. The local retail demand is practically nothing. A little coal is moving, but the tonnage is so small that it is not a factor. The current steam business helps a little, but in a general way there is no coal coming into St. Louis to speak of. The same condition applies to the country business.

Large steam plants are using up their

of. The same condition applies to the country business.

Large steam plants are using up their surplus, realizing that no buying on the part of a large number has a tendency to bring the market down, so that when the time is ripe they can begin to put coal away, if necessary. One large plant is taking one half of its current needs out of the storage pile and buying on the open market at greatly reduced prices.

Screenings are heavy from all fields and in the Standard market are bringing about \$1.50 at the mine. Carterville screenings are plentiful, and here and there a slight break in the Government price is reported. The railroads at this time are the life-savers in the Standard coal fields, and this applies also to the Mt. Olive and Carterville fields. The tonnage of railroad coal the past week has increased and it is likely to from now on. Some large contracts are being made right now that will carry through to the first of April on railroad business, running into several hundred thousand tons from the Standard field.

Throughout the field the tonnage is in-

dred thousand tons from the Standard field.

Throughout the field the tonnage is increasing at the individual mines, although it means less days of work, because the miners affected by the influenza epidemic are returning to work. In the Mt. Olive field the mines are working exceptionally well, and a good tonnage moves north.

In the Carterville and Du Quoin fields there is a slight surplus of coal. Prices are holding remarkably well. Railroad tonnage here continues good, cars are rather plentiful and the supply of men is getting better.

There are no outside coals coming into the St. Louis market except a little Arkansas, and this does not run over ten to welve cars per week right now. The price of this coal is so outrageously and unreasonably high that the public in St. Louis will not stand for such imposition.

Coke is plentiful, with no buyers, because the price is too high.

With the exception of Standard coal prices, on which screenings are \$1.25; 2-in. lump, \$1.75; 6-in. lump, \$2, and 2 x 6 egs at \$2, and Mt. Olive lump slipping a trifle, there is no change from the Government maximum prices, which are, f.o.b. mine per net ton:

Williamson Mt. Olive

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump	\$2.55@2.75	\$2.55@2.75	\$2.40@2.70
	2.55@2.75	2.55@2.75	2.40@2.70
	2.55@2.75	2.55@2.75	2.40@2.70
No. 1	3.05@3.20	3.05@3.20	
	3.05@3.20	3.05@3.20	
No. 3	3.05@3.20	3.05@3.20	
Mine Run	2.35@2.50	2.35@2.50	2. 20@ 2. 30
Screenings	2.17@2.32	2.17@1.32	1.50@1.60
Ci-1			

Special preparation on Carterville is 10 cents extra Williamson & Franklin Co. rate is \$1.10. Other fields 95 cents.

General Statistics

BALTIMORE & OHIO

The following is a statement of the coal and coke tonnage moved over the Baltimore & Ohio system and affiliated lines during the month of July, 1918, as compared with the corresponding month of the previous

								1918 Tons	1917 Tons
Coal Coke								4,564,857 290,772	3,259,844 316,557
								4,855,772	3,576,401